Preface

The past decade has seen a remarkable upsurge of information in the field of plant pathology in Malta. This is particularly so with respect to pathogenic fungi and fungal-like plant pathogens. In 1994, this Ministry embarked on a Plant Quarantine Strengthening Project funded by FAO, and through this co-operation project, several leading experts were engaged in Malta to carry out field work and report plant pests and diseases encountered. Shortly afterwards, a Plant Pathologist and a Nematologist were engaged to work with the Plant Health Section of this Ministry, under the United States of America Peace Corps Volunteer scheme. With Malta's entry in the European Union, our Ministry could benefit from a number of twinning projects, one of which was directly related to phytosanitary aspects and again several short term experts came to Malta not only to carry out field work but also to train our staff in different disciplines among which different aspects of plant pathology. The senior author of the present work was engaged as a consultant in Plant Pathology for the last two years.

All the above mentioned activities, especially the original research work carried out by both Dr Angelo Porta-Puglia and Dr David Mifsud in these last two years, provided the bases of this current publication entitled "*Fungal and fungal-like plant pathogens of the Maltese Islands*". In this work, original finds of more than 30 pathogenic fungi are included, not to mention the numerous new host records and new localities for already known diseases.

Apart from the great amount of scientific input that this publication contains, I found it extremely user friendly through the use of the three Appendices. Appendix I provides a list of pathogens by host plant. The host plant is listed in the scientific Latin name, which is not so user friendly for the non-specialist. To counter balance this, the authors have included in Appendix III a list of host plants by common English and Maltese name and the corresponding scientific name. Appendix II is also very useful as it denotes the common English name of the various diseases and, for each, the corresponding pathogen(s) are included. Through these appendices, it is then very easy to make reference in the Annotated lists of plant pathogenic *Protozoa*, *Chromista*, and *Fungi* encountered in the Maltese Islands.

The time is certainly ripe to take stock of this abundance of information which has accumulated especially in recent years. This work, which includes a comprehensive review of what has been done in Malta in the field of pathogenic fungi and related organisms, by two dedicated scientists, serves this purpose admirably. It will undoubtedly become an authoritative reference work, not only for Maltese scholars, but also for professional and practical plant pathologists working in Europe and the Mediterranean Region.

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FUNGAL AND FUNGAL-LIKE PLANT PATHOGENS OF THE MALTESE ISLANDS

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Summary

The paper provides updated lists of plant pathogenic species belonging to the kingdoms *Protozoa*, *Chromista* and *Fungi* (one, 21, and 211 species entries, respectively) recorded in Malta. It is intended primarily for the use of plant pathologists and authorities involved in plant protection and quarantine issues. It is based on published papers and unpublished reports of several authors and on our original data. The latter were based on inspections in the field and at the Maltese fruit and vegetable market, on surveys requested by EC and on samples brought by farmers at the Għammieri, Marsa, laboratories of the Ministry for Rural Affairs and the Environment (MRAE). They include records or more than 30 species new for Malta and several new host and new location records.

Major diseases observed during 2004-2006 include Verticillium wilt of olive, late blight of potato and tomato, powdery mildew on several hosts, crown and root rot (*Forl*) of tomato, Sclerotinia stem rot of vegetables, grey mould of several crops, leaf mould of tomato.

Most of the pathogenic species reported at the beginning of the last century are still present. Several species, including *Spongospora subterranea* f. sp. *subterranea*, *Colletotrichum acutatum, Fusarium oxysporum* f. sp. *radicis-lycopersici,* probably have been introduced recently. Intensified plant trade, due to world trends and the accession of Malta into the EU, increases this risk and requires consolidating the national quarantine service and extending monitoring of the territory.

The incidence and severity of some diseases could be traced back to inappropriate cultural practices or unsuitable seed or plant material. MRAE and private organisations have a key role to play in improving this situation.

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Key words: Pathogens of crops, Pathogens of wild flora, *Protozoa*, *Chromista*, *Fungi*, Malta, Gozo.

Riassunto

Funghi e organismi fungo-simili patogeni delle piante a Malta

Il presente lavoro fornisce elenchi aggiornati di specie patogene appartenenti ai regni *Protozoa*, *Chromista* e *Fungi* (rispettivamente una, 21 e 211 specie elencate) osservati a Malta, utili per i patologi vegetali e per le istituzioni coinvolte nella protezione delle piante e negli aspetti di quarantena. Esso è basato su lavori pubblicati e rapporti non pubblicati di diversi autori, nonché su nostri dati originali. Questi ultimi derivano da visite in campo e presso il Mercato ortofrutticolo di Malta, da indagini richieste dalla CE e da osservazioni di campioni portati dagli agricoltori ai laboratori di Għammieri, Marsa, del Ministero per gli Affari Rurali e l'Ambiente (MRAE). Essi comprendono segnalazioni nuove per Malta di specie (più di 30), nonché di ospiti e località.

Le principali malattie osservate nel periodo 2004-2006 comprendono: Verticillosi dell'olivo, Peronospora della patata e del pomodoro, Mal bianco di diversi ospiti, Marciume del colletto e delle radici (*Forl*) del pomodoro, Marciumi da *Sclerotinia* su piante ortive, Muffa grigia su vari ospiti, Cladosporiosi del pomodoro. Molte delle specie segnalate agli inizi del secolo scorso sono tuttora presenti. Altre, quali *Spongospora subterranea* f. sp. *subterranea*, *Colletotrichum acutatum*, *Fusarium oxysporum* f. sp. *radicis-lycopersici*, sono probabilmente di recente introduzione. L'intensificarsi degli scambi internazionali di vegetali, legati alle tendenze mondiali e al recente ingresso di Malta nell'UE, fanno aumentare questo rischio e richiedono il rafforzamento del servizio nazionale di quarantena e l'intensificazione del monitoraggio del territorio. L'incidenza e la severità di alcune malattie è attribuibile a carenze nelle pratiche colturali o all'uso

di sementi o materiali di moltiplicazione inadeguati. Le istituzioni del MRAE e le organizzazioni private di settore possono svolgere un ruolo importante nel miglioramento della situazione.

(Ricevuto il 26 ottobre 2006)

Parole chiave: Patogeni di piante coltivate, Patogeni della flora selvatica, Protozoi, *Chromista*, Funghi, Malta, Gozo.

Introduction

The Republic of Malta (316 km^2, c. 400,000 inhabitants) consists of a group of small islands located in the central Mediterranean Sea, 96 km from Sicily (Italy) and 290 km from northern Africa. Latitude of the Maltese Archipelago extends from 35°48'28" to 36°05'00" North. Longitude is comprised between 14°11'04" and 14°34'37" East. The major islands are Malta (245.7 km^2) and Gozo (67.1 km^2).

Maltese soils are closely similar to the parent rock material: marine sedimentary rocks, mainly Oligo-Miocenic limestones, and minor quaternary deposits of terrestrial origin. According to the Kubiena system, they could be classified as *terra soils*, *xerorendzinas* and *carbonate raw soils*. In the cultivated areas there are also soil complexes formed through the human activities, including mixing of diverse soils transported from different areas, addition of rock debris and domestic waste in reclamation of disused quarries and in other land-reclamation activities (Schembri, 1993).

There are no mountains, rivers or lakes but there are minor springs and valley systems, only very few of which retain water all year round. Carsic limestone plateaux, clay-covered hillsides and limestone plains characterise the islands. In both Malta and Gozo, the south-west coast is mostly elevated and the land tills gently towards the north-east. The maximum elevations in Malta and Gozo are, respectively, Ta' Zuta (253 m above see level), on Dingli Cliffs, and Dbiegi (191 m).

Valleys (*widien*, singular: *wied*) had been shaped by erosion and nowadays they convey runoff during the wet season. Average rainfall is about 550 mm per year, mostly concentrated from October to March. It is estimated that up to 25% of rainwater percolates through limestone rocks and accumulates in aquifers from where it seeps out in springs or is tapped or pumped for irrigation and other uses. The islands are sunny and windy. Erosion is important due to the large non-irrigated areas in which the soil is bare in the driest season. The frequent rainstorms which are common

at the beginning of the wet season are another cause of erosion. The large soil surface covered by buildings and roads increases the violence of runoff, resulting in more loss of soil and water to the sea. The range of the mean monthly air temperature is 12-26 °C but grass temperature may reach the upper forties in summer and fall below 0 °C in the period from December to April (Schembri, *l. c.*).

It is thought that before colonisation by man the islands were covered with *Mediterranean sclerophyll forest* characterised by holm oak (*Quercus ilex*) and Aleppo pine (*Pinus halepensis*), associated to smaller trees, shrubs and climbers. Use of wood by man and grazing by sheep and goats, introduced by the early colonisers, have brought to the extinction of these forests, of which very limited remnants are visible at present in the island of Malta. The Buskett area (Malta), although planted by man, is now self-regenerating and considered as a *semi-natural woodland* (Schembri, *l. c.*) and is the only woodland ecosystem present nowadays. Other major ecosystems include *maquis*, *garrigue*, and *steppic grassland*. Due to the high human pressure on the natural environment in the major islands (the Republic of Malta is inhabited since extremely remote times and at present it is the most densely populated country of the EU: c. 1,200 inhabitants per km^2) a large coverage is provided by communities of *disturbed ground*. *Coastal*, *rupestrial* and other minor communities occupy particular or rare habitats (Schembri, *l. c.*).

The agricultural landscape could be described by three major elements, which are strictly correlated with socio-economic conditions of the respective areas: (i) garden-type (*rdum* and *gnien*), where fruit trees are grown intensively and yield high profits; (ii) barren meadows (*xaghra*), when used, fodder and legumes are grown there and the profits are poor; (iii) dry-farming areas, which represent most of the arable land, varying in crop quality and revenue according to exposure, slope and water supply. Potatoes (the favourite crop) and high-value vegetables (melons, tomatoes, artichokes etc.) are grown in the irrigated areas. Olive and grapes, known since the most ancient times and successively replaced or abandoned (due to the development of cotton industry in the case of olives, and to outbreaks of phylloxera in the case of grapes) are nowadays quickly expanding in Malta and Gozo.

The origin of agriculture in Malta is remote and is documented by tools and equipments discovered in Neolithic sites. Roman historians reports about cotton and honey production. Before the advent of the Knights of the Order of St Johns in 1530, the mostly farming Maltese society was able to provide a relatively good standard of life.

Important villages, with churches and chapels adorned with valuable art and artefacts, indicate that in several places agriculture had provided more than the subsistence, at least to a part of its inhabitants. The Knights brought new activities related to building and repairing their important fleet, and at that time agriculture started loosing its absolute primacy. After Malta passed under the British Crown in 1814, secondary and tertiary activities increasingly absorbed parts of the active population. Since the mid nineteenth century transformation from subsistence to commercial agriculture accelerated and the production and social changes were accentuated by the needs related to its strategic position during World War II. The demobilisation after the war and the massive unemployment which followed generated a massive migration, mostly of young people from the farming areas. Also for this reason, the decline of agriculture continued during the phases of Self-government (1946-1958), the return of Colonial rule (1958-61) and after the accession to Independence (1964) (Busuttil, 1993).

More recently, the increase of secondary and tertiary activities and the increasing impact of tourism on the economy have further reduced the relative importance of agriculture. The accession of Malta into the European Union (2003) has introduced new relevant factors of change. Namely, an accentuated stress on quality products is very likely to have significant impact in the future of agriculture in Malta. Due to these new challenges the knowledge of the plant health conditions and the development of plant protection management strategies suitable for the new needs are expected to play a major role.

Plant protection always had a relatively high focus on the Maltese agricultural community. In the 1920s Prof. John Borg, then superintendent of Agriculture, was much involved in plant protection and integrated pest management. His book (Borg, 1922), Diseases and cultivation of fruit trees in the Maltese Islands, was one important contribution in this respect. In 1956, Dr Brian Wheeler of the International Mycological Institute, Kew, UK, was assigned a six-month stay in Malta to work as plant pathologist. Much of this work was latter published (Wheeler, 1957) and to-date it remains as the most important contribution incorporating all plant pathological aspects (with the exception of nematology) for Malta.

In the 1960s much effort was made by government to establish a plant health service including laboratory facilities and trained personnel. One very important contribution of this service included the potato blight warning. This service seems to have been fully functional from the early 1960s till the late 70s (J. Aquilina, personal communication).

In total six thermohygrograph stations were present in Malta (Għajn Tuffieħa, Għammieri, Żabbar, Qrendi, Żebbug) and Gozo (Xewkija) and these were read weekly. If high humidity and temperature suitable for infection were recorded for at least a 48 hour period, a warning was issued. Such warnings were included in local newspapers, on the local Radio station and they were also brought to the knowledge of the Christian community at the conclusion of Sunday mass celebration (G. Carbone, personal communication). In this way, all growers used to be alerted on time for the application of plant protection products.

In 1994, the then Plant Health Section of the Ministry for Agriculture and Fisheries, embarked on a Plant Quarantine Strengthening Project fully funded by FAO. This technical co-operation project (TCP) involved a number of experts from different disciplines (including plant pathologist, entomologists, legal advisers) and much field investigations and laboratory analyses were carried out on plant samples. Much of these findings are to be found in unpublished FAO reports (e.g. Wheeler, 1994a, 1994b).

In 1996, Dr Fred Brooks came to work in Malta as a plant pathologist under the United States of America Peace Corps Volunteer scheme. He worked in Malta for almost a three year period during which he was involved in field inspections and laboratory diagnosis of plant material. Again much of his reports (e.g. Brooks 1998a, 1998b) are unpublished ones pertaining to the Department of Agriculture. His book (Brooks, 2001), Plant Disease Manual for semiarid and Mediterranean-type climates, was mainly based on his experience in Malta.

In 2002-2004 Malta took part in a twinning programme on Phytosanitary aspects and among other issues a number of short term experts came to Malta to train staff in plant health and quarantine aspects. Several interim reports have been compiled, some of which including original data on plant health aspects.

Generally, there is a lack of bacterial, phytoplasmas and virus or virus like-plant pathogens recorded in Malta and few surveys were carried out to get an overall picture of such organisms occurring locally. A number of unpublished reports are available at MRAE. However, the following publications can be consulted for these pathogens: Attard, 2002; Martelli *et al*., 1992; Gallitelli *et al*., 2004; Bonavia Gatt and D'Onghia, 2002. Such lists could be used by both plant pathologists and authorities involved in planning and managing plant protection and quarantine issues in the Maltese territory and, consequently to the recent accession of the Country into the EU, at the Union borders.

The major aim of the present paper is to provide a list of pathogenic species recorded in Malta.

The organisms dealt with in this contribution have been grouped under the three headings of *Protozoa*, *Chromista* and *Fungi* according to the present phylogenetic views.

The lists of pathogenic species causing plant diseases in Malta are based on published works, on reports of visiting experts and on the more recent finding related to the activities of the senior author, from March 2004 to February 2006, as a consultant at the Department of Plant Health of the Ministry for Rural Affairs and the Environment, Agricultural Research and Development Centre, Għammieri, Marsa, Malta. The major sources of written information on plant diseases in Malta in the last 50 years are a publication from Wheeler (1957), the section on fungi in a general inventory of local living organisms (Lanfranco, 1989), two unpublished reports by Brooks (1997, 1998a) and indexes (Brooks, 1998b), and some recent papers (Porta-Puglia and Mifsud, 2005a, b, c and 2006a, b, c; Porta-Puglia *et al*., 2005; Pace-Lupi *et al*., 2006). These have been integrated with information from reports concerning visits to Malta by Wheeler (1994a and 1994b), the studies carried out within the framework of FAO-UNDP projects by Collingwood (1971 and 1972) and Mazzocchi and Debattista (1971).

Previously, exhaustive lists of fungi were authored by Saccardo (1912, 1914, 1915), based on material collected by A. Caruana Gatto and J. Borg, and by Sommier and Caruana-Gatto (1915). The latter includes Saccardo's findings and some additions. Although these papers are more oriented to mycology than to plant pathology, several species (including species new to science) found in Malta are of interest for the plant pathologist and several references to this previous investigations have been provided in the present lists.

The authors have integrated the data of Wheeler (1957) in the lists for two reasons: (i) his paper has been published in a very low number of copies and is not available in most libraries, including those of some Maltese institutions; (ii) by our experience, most of his findings are still valid and worthy to be largely known.

During the work reported in this paper, attention was mostly directed to diseases of economically important crops, although other host species have also been studied, due to their possible role as infection sources or to their impact on the local wild flora. Some other pathosystems were taken into account for their potential interest in studies on biological control of weeds.

A few 'macrofungi' only, mostly related to wood decay, are listed in the present paper. Their presence is certainly more important than it can appear hereby. Malta University, Department of Mathematics and Science, has a tradition of studies on macrofungi and has contributed valuable papers on this subject. Briffa and Lanfranco (1986) published an annotated list and a brief history of macrofungi in Malta. Other papers of interest in this area include Briffa (2002b and 2002c) and Pieri and Rivoire (1996).

Several books in English (e.g. Borg, 1922) and in Maltese (e.g. Vella, 1991) include information on diseases of cultivated crops but not all diseases mentioned therein are necessarily present in Malta unless otherwise stated. The monthly magazine, *Biedja u Said*, edited by the MRAE, deals with extension articles in Malteses related to fisheries and agriculture, including plant diseases (e.g.: Mifsud and Porta-Puglia, 2005). Papers of mycological interest (e.g. Tabone, 2002) could be found in *The Central Mediterranean Naturalist* which is presently the official scientific peer-reviewed journal of Nature Trust (Malta).

Dissertations prepared at the Institute of Agriculture, University of Malta, also deal with aspects of plant pathology. Most of them remain unpublished. An article based on a M. Sc. dissertation concerning a survey on fungi (pathogenic and saprophytic) observed on grapes in Malta and Gozo has been published (Tabone, 2002). Some of the finding of a Diploma dissertation by Stephen Mifsud (2005, unpublished), co-tutored by the senior author, have been included in the present paper. Dissertations prepared abroad are sometimes based on Maltese material (e.g.: Pace Lupi, 2005, unpublished) and provide additional information on plant pathology and related fields in Malta.

A large herbarium collection of over 10,000 accessions is maintained at the Argotti Botanical Garden in Floriana (J. Buhagar, personal communication). It includes the Caruana Gatto's and Borg's collections.

To facilitate the practical and easy use of the data, three appendices had been included in this paper:

Appendix I – List of plant pathogens by host;

Appendix II – List of diseases by common name (where available) and corresponding pathogen (s);

Appendix III – List of hosts by common English name followed by scientific and Maltese names.

Materials and methods

Species names and Authors of fungal names used in our lists are mostly based upon the *Index Fungorum*, edited and maintained in a joint partnership by CABI Bioscience, CBS and Landcare Research (http://www.indexfungorum.org). With a few exceptions, the 'current name' given for the species in the *Index* was adopted.

Scientific and common plant names are mostly based on the Plant database of the United States Department of Agriculture, Natural Resources Conservation Service (http://plants.usda.gov/cgi_bin). Some scientific plant names were taken from the IPNI website (www.ipni.org /index.html), implemented in collaboration between the Royal Botanic Gardens, Kew, the Harvard University Herbaria, and the Australian National Herbarium. For some common plant names, namely when there is difference between British and American use, we adopted the term chosen by Wheeler (1957).

Our observations were done on:

(i) plants directly examined and sampled during field inspections;
(ii) plant material which the growers brought to the plant pathology laboratory;
(iii) fruit and vegetables inspected at the Malta official fruit and vegetable market (*Pitkalija*), at Ta' Qali.

Except when otherwise stated, our list is based upon symptoms and signs observed on the host and on the putative pathogens found associated to the diseased host. Identification of pathogenic species was done through macroscopic and microscopic characters observed on the host (directly or after incubation in moist chambers) or on isolates in pure cultures from diseased plant material. Isolations have been either attempted directly from fungal fructifications or by plating plant tissues after appropriate washing and/or surface disinfestations with a solution of sodium hypochlorite (1-2 % active Cl, 1-5 min). Alternatively, to isolate root pathogens, root portions were disinfested by immersion in 1:1000 water solution of $HgCl_2$ followed by accurate rinsing (5-6 times) in sterile water. Ethanol (75%) was also used, alone or in combination with one of the other disinfestants. Most of the fungi were isolated on tap water agar (TWA), potato dextrose agar (PDA) or corn-meal agar (CMA). Isolates were usually maintained on PDA slants.

A collection of 24 isolates of *Verticillium dahliae* has been established. Each isolate was kept on PDA slants under mineral oil and on sterilised soil in screw-capped tubes. There is also a collection of 8 isolates of *Fusarium oxysporum* f. sp.

radicis-lycopersici. A collection of diseased plant organs in formaldehyde water solution (5%) has been established. *Exsiccata* of diseased plants parts and/or fungal colonies (on PDA, TWA or CMA) have been prepared. These collections are deposited at the Plant Pathology Laboratory, Research and Development Centre, Għammieri, Marsa, Malta.

Reference to collections (of which a few numbers are missing) in the lists is made as follows:

(i) plant parts under formaldehyde-water: F1 to F16;

(ii) *exsiccata*: E1 to E 110.

Two surveys were carried out in 2004 and 2005 in order to comply with the EU Member States requirements concerning *Phytophtora ramorum*. Twenty-one and 22 locations (public gardens, parks, nurseries and *garrigue* sites) were inspected during 2004 and 2005, respectively. The following species were examined: *Arbutus unedo*, Azalea, *Camellia japonica*, Gardenia, *Laurus nobilis*, *Lonicera implexa*, *Lonicera* sp., *Magnolia grandiflora*, *Quercus ilex*, *Quercus pubescens*, *Quercus robur*, *Viburnum lucidum*, *Viburnum tinus*, *Viburnum odoratissimum*. When suspect symptoms were observed, microscopic observations were done directly on samples or after their incubation in moist chambers. When deemed necessary, isolations were also attempted.

Results

The pathogenic species belonging to the kingdoms *Protozoa*, *Chromista* and *Fungi* are listed in Table 1, 2 and 3, respectively. Simptoms induced by some species are shown in Fig. 1 (*Protozoa*), Fig. 2 (*Chromista*) and Fig. 3-4 (*Fungi*). Locations of new records are shown on Map. 1. The tables provide scientific name of the pathogenic species, name of the disease they induce, host common name and scientific name, location and date of observation. When necessary, remarks and the appropriate references are given. Each list entry starts from the data of Wheeler (l957), when applicable, and includes the successive findings with reference to the respective Author(s). When no reference is given, the entry refers to our unpublished original data (in this case, month and year of observation are given for each location). When, for a given entry, published reports have been found and deemed appropriate, these are mentioned in the comment column. We apologise hereby for unavoidable omissions.

TABLE 1 - Annotated list of plant pathogenic *Protozoa* observed in Malta.

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Spongospora subterranea (Wallr.) Lagerheim f. sp. *subterranea* Tomlinson. Powdery scab	Potato (*Solanum tuberosum* L.) cv Derby	Qrendi (April 2005, E33, F1, F2)	Extremely severe symptoms on tubers (Fig. 1, A, B and C), with abundant tissue proliferation, mimicking black wart (Porta-Puglia and Mifsud, 2006-a)
	cv Volva	Qrendi, Magħtab (both April 2005)	Symptoms on tubers were severe to moderate at Qrendi. Consignements were refused at the Ta' Qali Grading Station.
	cv Druid	Qormi (July 2005)	Severe to moderate symptoms on stored tubers
	cv Cara	Mġarr (December 2005)	On one single seed tuber (seed lot imported from Ireland)

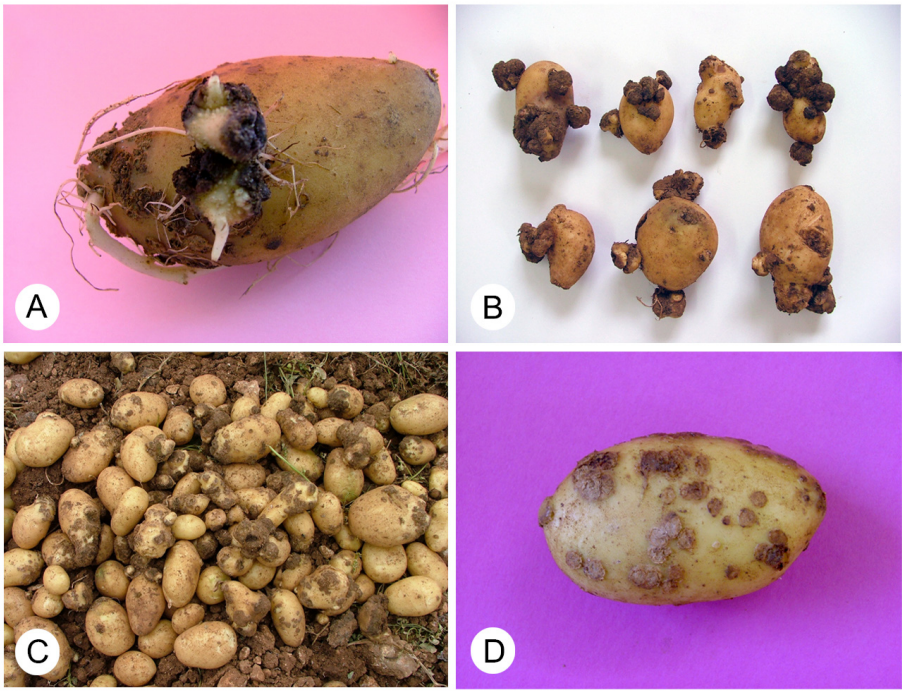


Fig. 1 - Diseases caused by *Protozoa*. A, B, C, D) Powdery scab (*Spongospora subterranea* f. sp. *subterranea*) on potato tubers.

Table 2 - Annotated list of plant pathogenic *Chromista* observed in Malta.

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Albugo candida (Pers.) Kuntze. White rust	Perennial wall rocket [*Diplotaxis tenuifolia* (L.) DC.]	Għammieri, E78, E83 and Ta' Xbiex, E87 (both November 2005)	Reported by Saccardo, 1912, as *Cystopus candidus*
	Bargeman's cabbage [*Brassica rapa* ssp. *silvestris* (L.) Lam. & Janch.]	Wardija (February 2006)	Fig. 2, A
	Shepherds' purse [*Capsella bursa-pastoris* (L.) Medik.]	Għammieri	Wheeler, 1957
	White wall rocket [*Diplotaxis erucoides* (L.) DC.]	Buskett	Wheeler, 1957. Reported by Saccardo, 1912, as *Cystopus candidus*
		Msida (November 1997)	Mifsud (unpublished)
Bremia lactucae Regel. Downy mildew	Groundsel (*Senecio vulgaris* L.)	San Anton	Wheeler, 1957. Also in Saccardo (1912)
	Lettuce (*Lactuca sativa* L.)	Għammieri, Siġġiewi-Dingli	Wheeler, 1957
		Rabat	Brooks, 1998b
		Qormi (May 2004, E17 and E18), Siġġiewi (July 2004), Żabbar (December 2004)	Found at *Pitkaljia* Market on 2 consignements from Siġġiewi, 3 from Qormi and one from Zabbar
	Sow-thistle (*Sonchus oleraceus* L.)	Għammieri	Wheeler, 1957. Already reported by Saccardo (1912)

TBLE 2 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
		Għammieri (November 2005, E90)	
Peronospora destructor (Berk.) Casp. ex Berk. Downy mildew	Onion (*Allium cepa* L.)	Għammieri, Ta' Qali	Wheeler, 1957
		Qrendi , Żejtun	Brooks, 1998b
Peronospora farinosa (Fr.) Fr. f. sp. *spinaciae* Byford. Downy mildew	Nettleleaf goosefoot (*Chenopodium murale* L.)	Għammieri	Wheeler, 1957 [as *Peronospora effusa* (Grev.) Rabenh.]
	Spinach (*Spinacia oleracea* L.)	Siġġiewi (March 2004, E2)	Sample collected at *Pitkalija* Market
Peronospora matthiolae Gäum. Downy mildew	Stock [*Matthiola incana* (L.) R. Br.]	Għammieri (April 2005, E13; June 2005, E50; November 2005, E84), Pietà (December 2005, E94)	*Peronospora parasitica* was reported (Wheeler, 1957) on *Matthiola* sp. at Rabat
Peronospora parasitica (Pers.) Fr. [syn: *Hyaloperonospora parasitica* (Pers.) Constant.]. Downy mildew	Cabbage (*Brassica oleracea* L. var. *capitata* L.)	Mġarr	Wheeler, 1957
	Kohlrabi (*Brassica oleracea* L. var. *gongylodes* L.)	Dingli	Wheeler, 1994

	Shepherds' purse [*Capsella bursa-pastoris* (L.) Medik.]	Għammieri	Wheeler, 1957
	Stock (*Matthiola* sp.)	Rabat	Wheeler, 1957. *Peronospora parasitica* f. *matthiolae-annuae* Roum is also known on this host (www.indexfungorum.org)
	White wall rocket [*Diplotaxis erucoides* (L.) DC.]	Buskett	Wheeler, 1957
	Perennial wall rocket [*Diplotaxis tenuifolia* (L.) DC.]	Għammieri (November 2005, E82)	
Peronospora trifoliorum de Bary. Downy mildew	Sweetclover [*Melilotus indicus* (L.) All.]	Għammieri (?)	Wheeler, 1957
Peronospora viciae (Berk.) Casp. Downy mildew	Pea (*Pisum sativum* L.)	Fiddien, Pwales, San Anton	Wheeler, 1957. *Peronospora viciae* (Berk.) De Bary reported by Saccardo (1912, 1915) on *Lathyrus odoratus*
Peronospora sp. Downy mildew	Basil (*Ocimum basilicum* L.)	Mellieħa (November 2005, E88), Mtarfa, (September 2005, E65, E71, E75), Żabbar, (September 2005, E66)	Morphologically similar to *P. lamii*, but not pathogenic on *Salvia*, see Garibaldi *et al*., 2004, and Porta-Puglia and Mifsud, 2006c
Phytophthora capsici Leonian	Pepper (*Capsicum annuum* L.)	Għammieri	Brooks, 1998b
Phytophthora citricola Sawada	Citrus (*Citrus* sp.)	Birkirkara	Brooks, 1998b
Phytophthora cryptogea Pethybr. & Laff. Phytophthora crown and root rot	Gerbera daisy (*Gerbera jamesonii* Bolus ex Hook.)	Żabbar (February 2005)	Detected on a single imported plant
Phytophthora infestans (Mont.) de Bary Late blight	Potato (*Solanum tuberosum* L.)	Buskett, Gozo, Lija	Wheeler, 1957.

TBLE 2 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
		Widespread	Brooks, 1998b
		Burmarrad (February 2005), Għammieri (April 2004, E14, F3; January 2006, E100), Ħal-Farruġ (December 2004, E27), Mosta (February 2005), Qormi (April 2005), St. Paul's Bay (April 2005)	Also at Dingli, Marsascala and Qrendi (March 2005) and Żurrieq (April 2005) (S. Mifsud, personal communication). Widespread in Malta and in the Gozo localities of Għajnsielem and Għasri (April 2005) (R. Tanti, personal communication)
Stem blight	Tomato (*Solanum lycopersicum* L.)	Not known	Collingwood, 1971 and 1972
		Gozo, Mellieħa	Wheeler, 1957
		Widespread	Brooks, 1998b
		Għammieri (January 2006)	
Phytophthora nicotianae Breda de Hann	Aubergine (*Solanum melongena* L.)	Għammieri	Brooks, 1998b (as *Phytophthora parasitica)*
	Citrus (*Citrus* sp.)	Widespread: Attard, Għammieri, Girgenti, Luqa, Ħal-Farruġ, Rabat, Ramla Bay, Siġġiewi, Wardija, Xewkija, Żeitun	Brooks, 1998b
	Peach (*Prunus persica* Batsch)	Wardija, Għammieri	Brooks, 1998b

	Pepper (*Capsicum annuum* L.)	Qormi	Brooks, 1998b. We cannot exclude that the report refers to *Phytophthora capsici* Leonian, syn.: *Phytophthora parasitica* var. *capsici* (Leonian) Sarej.
	Strawberry (*Fragaria* × *ananassa* Duch.)	Chadwick Lakes, Mġarr	Brooks, 1998b
	Tomato (*Solanum lycopersicum* L.)	Għammieri, Mġarr	Brooks, 1998b
Phytophthora sp.	Araucaria (*Araucaria* sp.)	Xewkija	Brooks, 1998b
	Citrus (*Citrus* sp.)	Birkirkara, Xaghra	Brooks, 1998b
	Peach (*Prunus persica* Batsch)	Wardija	Brooks, 1998b
	Pepper (*Capsicum annuum* L.)	Għammieri	Brooks, 1998b
	Strawberry (*Fragaria* × *ananassa* Duch.)	Dingli	Brooks, 1998b
Plasmopara viticola (Berk. & M. A. Curtis) Berl. & de Toni. Downy mildew	Grapevine (*Vitis vinifera* L.)	Fiddien, Gozo	Wheeler, 1957. Mentioned among the most common causes of disease of grape by Collingwood (in Mazzocchi and Debattista, 1971)
		Widespread: Attard, Burmarrad, Mġarr, Rabat Ramla (Gozo, June 2004), Burmarrad (August 2005, E61)	Brooks, 1998b
Pseudoperonospora cubensis (Berk. & Curtis) Rostov. Downy mildew	Cucumber (*Cucumis sativus* L.)	Għammieri, Żabbar, Żebbuġ	

TBLE 2 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
	Marrow (*Cucurbita pepo* L.)	Ħal-Farruġ (E72), Rabat, Safi (E74) (all three October 2005), Siġġiewi (November 2004, F23)	
	Melon (*Cucumis melo* L.)	Rabat	Wheeler, 1957
		Għammieri (November 2005, E80), Żabbar (October 2004, E21)	
Pythium aphanidermatum (Edson) Fitzp.	Bitter almond (*Amygdalus communis* L.)	Luqa (St. Vincent de Paul Residence, Marsa)	Brooks, 1998b
Pythium echinulatum V.D. Matthews	Araucaria (*Araucaria* sp.)	Siġġiewi	Brooks, 1998b
	Grapevine (*Vitis vinifera* L.)	Wardija	Brooks, 1998b
	Melon (*Cucumis melo* L.)	Żejtun	Brooks, 1998b
	Peach (*Prunus persica* Batsch)	Binġemma, Mosta	Brooks, 1998b
	Strawberry (*Fragaria* × *ananassa* Duch.)	Dingli, Mġarr	Brooks, 1998b
Pythium sp.	Araucaria (*Araucaria* sp.)	Xewkija	Brooks, 1998b
	Cauliflower (*Brassica oleracea* L. var. *botrytis* L.)	Not known	Brooks, 1998b

	Chayote [*Sechium edule* (Jacq.) Sw.]	Rabat (December 2004)	Sample collected at *Pitkalija* market
	Chrysanthemum (*Chrysanthemum* × *morifolium*)	Żabbar	Brooks, 1998b
	Citrus (*Citrus* sp.)	Widespread: Girgenti, Ħal-Farruġ, Kirkop, Safi, Xagħra, Xewkija	Brooks, 1998b
	Grapevine (*Vitis vinifera* L.)	Xewkija, Żabbar	Brooks, 1998b
	Laurustinus (*Viburnum tinus* L.)	Attard	Brooks, 1998b
	Onion (*Allium cepa* L.)	Għammieri	Brooks, 1998b
	Peach (*Prunus persica* Batsch)	Rabat, Wardija	Brooks, 1998b
	Strawberry (*Fragaria* × *ananassa* Duch.)	Ta'Qali	Brooks, 1998b
	Tomato (*Solanum lycopersicum* L.)	Dingli, Marsa, Xewkija	Brooks, 1998b
Wilsoniana portulacae (DC. ex Duby) Thines	Purslane (*Portulaca oleracea* L.)	Santa Venera (November 2005, E86, F4)	*Albugo portulacae* before the recent revision by Thines and Spring (2005). Sample collected by S. Mifsud. Also reported by Saccardo 1912 as *Cystopus portulacae*

* Disease name is given when known or mentioned in the relevant report.

** Citrus species are listed under "*Citrus*" common name to facilitate immediate comparison among different findings/reports which often are limited to the genus. Common species name is given when known.

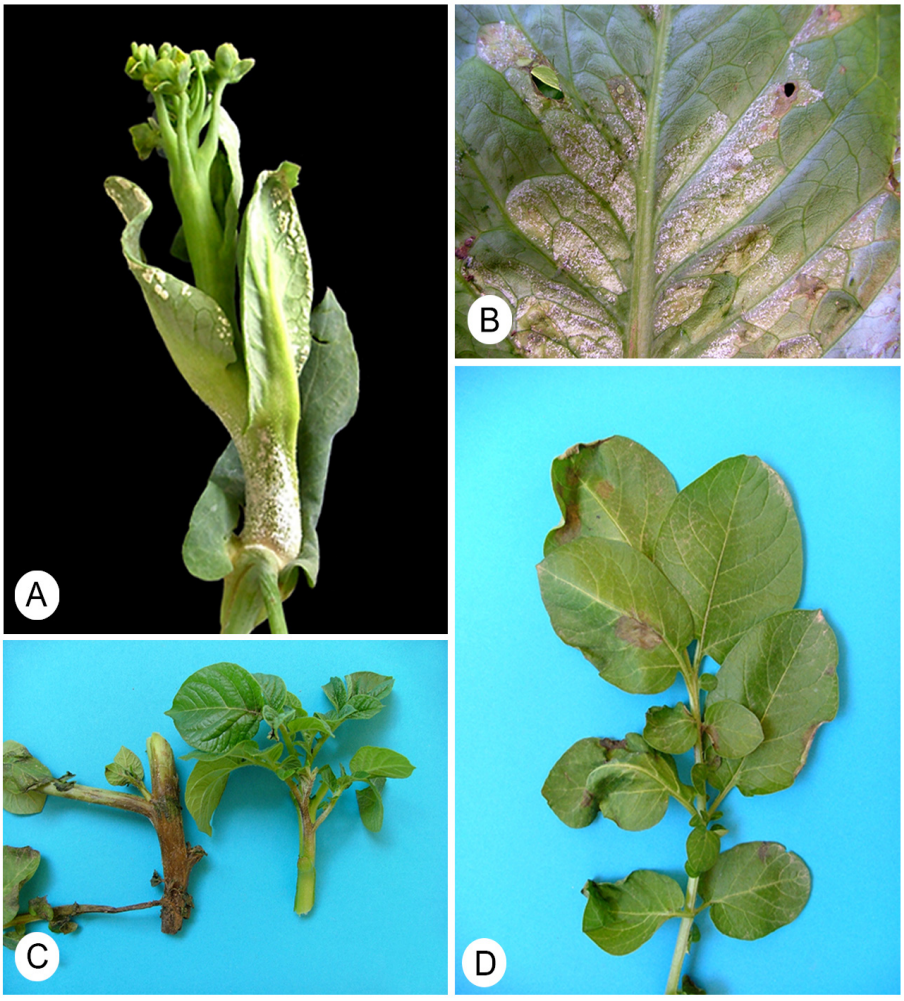


Fig. 2 - Disease caused by *Chromista*. A) White rust (*Albugo candida*) on bargeman's cabbage; B) Downy mildew (*Bremia lactucae*) on lettuce; C and D) Late blight (*Phytophthora infestans*) on potato.

TBLE 3 - Annotated list of *Fungi* pathogenic on crops and on wild flora observed in Malta.

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Aecidium clematidis DC. (syn.: *Puccinia recondita* Dietel & Holw.). Rust	Traveller's joy (*Clematis cirrhosa* L.)	Wied Inċita (November 2005, E76)	Sample collected by S. Mifsud
Alternaria alternata (Fr.) Keissler	Apricot (*Prunus armeniaca* L.)	Dingli	Brooks, 1998b
Alternaria brassicicola (Schwein.) Wiltshire. Leaf black spot	Kohlrabi (*Brassica oleracea* L. var. *gongyloides* L.)	Żebbuġ (December 2004)	Also *Alternaria brassicae* (Berk.) Sacc. was reported on broccoli at Attard (Saccardo, 1915)
Alternaria citri Ellis & N. Pierce			
Die-back	Lemon (*Citrus limon* Burm.)	Siġġiewi	Wheeler, 1957
Fruit-rot		Gozo	Wheeler, 1957
Alternaria dauci (Kühn) J. W. Groves & Skolko. Alternaria leaf blight	Carrot [*Daucus carota* L. ssp. *sativus* (Hoffm.) Arcang.]	Żabbar (December 2004, E26)	
Alternaria dianthi (?) F. Stevens & J. G. Hall. Leaf spot	Carnation (*Dianthus caryophyllus* L.)	Not known	Collingwood, 1972 (as Alternaria leaf spot; species not mentioned)
Alternaria porri (Ellis) Cif.	Onion (*Allium cepa* L.)	Żejtun	Brooks, 1998b
Alternaria solani Sorauer. Early blight	Tomato (*Solanum lycopersicum* L.)	Mġarr, Siġġiewi,	Brooks, 1998b
		Gozo	Wheeler, 1957
Alternaria sonchi Davis. Leaf spot	Sowthistle (*Sonchus oleraceus* L.)	Luqa (St Vincent de Paul Residence nursery) (November 2004, E25)	

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Alternaria tenuissima (Nees ex Fr.) Wiltsh.	Cabbage (*Brassica oleracea* L. var. *capitata* L.)	Pwales	Wheeler, 1957 [headrot: sunscald followed by saprophytic fungi, including *Cladosporium* sp. Similar symptoms observed by Porta-Puglia (unpublished) on samples from Zabbar, colonised by *Alternaria* and *Stemphylium*]
	Pear (*Pyrus communis* L.)	Chadwick Lakes	Wheeler, 1957 (on scorched leaves)
Fruit-rot	Tomato (*Solanum lycopersicum* L.)	Wied tal-Pwales	Wheeler, 1957
Armillaria mellea (Vahl) P. Kumm.	Citrus (*Citrus* sp.)	Attard	Brooks, 1998b
Ascochyta matthiolae Oudem. Leaf spot	Stock (*Matthiola* sp.)	Żabbar	Wheeler, 1957
Aspergillus niger v. Tiegh.			
Black mould	Onion (*Allium cepa* L.)	Żabbar	Wheeler, 1957
		Ħal-Farruġ (September 2005, E63)	On stored onion bulbs
Black rot	Grapevine (*Vitis vinifera* L.)	Birkirkara (August 2005), Wardija (September 2004)	Koch's postulates confirmed on surface disinfested grape berries in moist chambers (Wardija isolate)

Aspergillus ochraceus Wilhelm	Globe artichoke (*Cynara scolymus* L.)	Pwales	Wheeler, 1957 (associated with a rotting of globes which cause was not determined)
Blumeria graminis (DC.) Speer. Powdery mildew	Durum wheat (*Triticum durum* Desf.)	Gozo	Wheeler, 1957 (as *Erysiphe graminis* DC.). Saccardo (1912) reported *E. graminis* on *Koeleria phleoides*
		St. Thomas Bay (February 2006)	
	Bread wheat (*Triticum aestivum* L.)	Delimara	As *Erisiphe graminis* (Brooks 1998b)
Botryosphaeria dothidea (Moug.) Ces.& de Not.	Aleppo pine (*Pinus halepensis* P. Mill.)	Valletta	Brooks, 1998b
	Arar tree [*Tetraclinis articulata* (Vahl) Masters]	Valletta	Brooks, 1998b
Botryosphaeria rhodina (Berk. & M. A. Curtis) Arx. Die-back	Orange (*Citrus sinensis* Osbeck)	San Anton	Wheeler, 1957 (as *Diplodia natalensis* Evans)
	Lemon (*Citrus limon* Burm.)	Siġġiewi	Wheeler, 1957
		Safi (July 2004)	
Botryosphaeria stevensii Shoemaker	Peach (*Prunus persica* Batsch)	Siġġiewi (May 2005)	Isolated from branches showing die-back symptoms
Botryosphaeria sp.	Citrus (*Citrus* sp.)	Balzan (October 2004)	
Botryosphaeria sp.	Plum (*Prunus domestica* L.)	Mdina (August 2004)	Tentatively identified as *Botriosphaeria parva*
Botrytis cinerea Pers. Grey mould	Aubergine (*Solanum melongena* L.)	Għammieri, St Paul's Bay	Wheeler, 1994b

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
		Rabat (March 2004)	
	Azalea (*Rhododendron* sp.)	Burmarrad (October 2005)	In a nursery
	Courgette (*Cucurbita pepo* L.)	Għammieri	Brooks, 1998b
	Cucumber (*Cucumis sativus* L.)	Għammieri	Brooks, 1998b
	Edible fig (*Ficus carica* L.)	Qrendi (April 2005)	
	Gerbera daisy (*Gerbera jamesonii* Bolus ex Hook.)	Not known	Collingwood, 1972
		Żabbar	Brooks, 1998b
		Żabbar (February 2005)	
	Melon (*Cucumis melo* L.)	Mġarr (April 2005)	
	Bermuda buttercup (*Oxalis pes-caprae* L.)	St Paul Ta' Qlejja (March 2005)	
	Pepper (*Capsicum annuum* L.)	Mġarr (April 2005)	
	Rose (*Rosa* sp.)	Santa Venera (November 2005, E104)	

	Strawberry (*Fragaria* × *ananassa* Duch.)	Rabat	Brooks, 1998b
		Żabbar (February 2005)	
	Tomato (*Solanum lycopersicum* L.)	Għammieri, Mġarr, St Paul's Bay, Żabbar	Brooks, 1998b
		Buskett (April 2004, F5), Għammieri (January 2006), Rabat (March 2004), Rabat (Gozo, May 2005)	
Botrytis fabae Sardiña. Chocolate spot	Broad bean (*Vicia faba* L.)	Gozo	Wheeler, 1957
		Qormi (May 2004), Rabat (May 2005, E101), Siġġiewi (June 2004), Żabbar (April 2004)	
Caldariomyces fumago Woron. Sooty mould	Olive (*Olea europaea* L.)	Buskett	Wheeler, 1957
		Wied Ħas-Sabtan (March 2004, E7)	
Calonectria kyotensis Terash. Leaf blotch	Azalea *(Rhododendron* sp.)	Burmarrad (October 2005, E103)	Anamorph (*Cylindrocladium scoparium* Morg.) only observed. It was associated with *Chlamydomyces palmarum* on blotched leaves (in a nursery). Also on petals, associated to *Botrytis cinerea*
Cercospora apii Fresen. Early blight	Celery [*Apium graveolens* L. var. *dulce* (Miller) Pers.]	Mellieħa	Wheeler, 1957. Reported as *Cercospora petroselini* on parsley in Saccardo (1912, 1915)

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
		Wardija (November 2005, E91, E92)	
Cercospora ariminensis Cavara. Leaf spot	Spanish sanfoin (*Hedisarum coronarium* L.)	Attard, Buskett, Fiddien, Gozo, Rabat, Ta' Qali	Wheeler, 1957
Cercospora beticola Sacc. Leaf spot	Beetroot (*Beta vulgaris* L.)	Buskett, San Anton	Wheeler, 1957
		Msida (March 2004, E1)	
Cercospora canescens Ell. & Mart. Leaf spot	White vetch, Ochrus vetch [*Lathyrus ochrus* (L.) DC.]	Gozo	Wheeler, 1957
Cercospora insulana Sacc. Leaf spot	Statice [*Limonium brassicifolium* (Webb.) O. Kuntze, hybrid].	Żabbar	Wheeler, 1957. This species was first described by Saccardo (1915) based on samples of *Statice sinuata* collected at Ta Braxia and Addolorata cimiteries
Cercospora mercurialis Pass. Leaf spot	Annual mercury (*Mercurialis annua* L.)	Lija	Wheeler, 1957
		Bidnija, Zejtun (both February 2006)	
Cercospora neriella Sacc. Leaf spot	Oleander (*Nerium oleander* L.)	San Anton	Wheeler, 1957
Cercospora rubro-tincta Ellis & Everh. Leaf spot	Bitter almond (*Amygdalus communis* L.)	Gozo, Buskett	Wheeler, 1957
Cercospora scorpiuri Thüm.	Caterpillar plant (*Scorpiurus muricatus* L.)	Dingli	Wheeler, 1957

Cercospora smilacis Thüm. [syn.: *Passalora smilacis* (Thüm.) U. Braun]. Leaf spot	Sarsaparilla (*Smilax aspera* L.)	Wied tal-Mistra	Wheeler, 1957. Also present at the Argotti Botanical Garden Herbarium in *exiccata* dated around 1920s
		Wied tal-Mistra (November 2005, E77)	Sample collected by S. Mifsud
		Wied id-Dis (Madliena, February 2005,)	Sample collected by S. Mifsud
Cercospora zonata G. Winter. Zonate leaf spot	Broad bean (*Vicia faba* L.)	Gozo, Lija	Wheeler, 1957
	Common vetch (*Vicia sativa* L.)	Żabbar	Wheeler, 1957
Cercospora sp.	Carob tree (*Ceratonia siliqua* L.)	Dingli, Tal' Qroqq	Wheeler, 1957 [possibly *Pseudocercospora ceratoniae* (Pat. & Taubenh.) Deighton]
Chlamydomyces palmarum (Cooke) E.W. Mason	Azalea (*Rhododendron* sp.)	Burmarrad (October 2005)	Associated to *Calonectria kyotensis* on blotched leaves (in a nursery)
Cladosporium cladosporoides f. sp. *pisicola* (Snyder) G.A. de Vries. Scab	Pea (*Pisum sativum* L.)	Chadwick Lakes	Wheeler 1957
Cladosporium cucumerinum Ellis & Arthur. Scab	Cucumber (*Cucumis sativus* L.)	Not known	Collingwood 1972
Cladosporium sp	Apple (*Malus domestica* Borkh).	Mtaħleb	Wheeler 1957 (as secondary invader)
Cladosporium sp	Almond (*Amygdalus communis* L.)	Rabat (September 2005, E67)	Associated with leaf shot hole, possibly secondary invader
Cladosporium sp.	Chrysanthemum (*Chrysanthemum* × *morifolium* Ramat)	St Paul's Bay	Wheeler, 1994a
	Citrus (*Citrus* sp.)	Siġġiewi	Wheeler, 1957

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Ear blotch	Durum wheat (*Triticum durum* Desf.)	Girgenti	Wheeler, 1957 (as "probably secondary, following root disease")
Sooty mould	Oleander (*Nerium oleander* L.)	San Anton	Wheeler, 1957
		Għammieri (September 2005, E69)	
	Tomato (*Solanum lycopersicum* L.)	Sliema	Wheeler, 1957
–	Pear (*Pyrus communis* L.)	Chadwick Lakes	Wheeler, 1957 (on scorched leaves)
–	White poplar (*Populus alba* L.)	Chadwick Lakes	Wheeler, 1957 (on bark)
Coleosporium inulae Rabenh. Rust	False yellowhead [*Dittrichia viscosa* (L.) W. Greuter, syn.: *Inula viscosa* (L.) Ait.]	Fiddien, Mtaħleb	Wheeler, 1957
Colletotrichum acutatum J. H. Simmonds. Blackspot (anthracnose, 'false-fruit' rot)	Strawberry (*Fragaria* × *ananassa* Duch.)	St Paul's Bay (December 2005, E105, F16)	Porta-Puglia and Mifsud, 2006b
Colletotrichum coccodes (Wallr.) S. Hughes. Black dot	Potato (*Solanum tuberosum* L.)	Qrendi (April 2005, E32, E53, E58)	Porta-Puglia and Mifsud, 2005c
Colletotrichum fragariae A. N. Brooks	Strawberry (*Fragaria* × *ananassa* Duch.)	Rabat	Brooks, 1998b
Colletotrichum sp. Leaf spot	Friar's cowl (*Arisarum vulgare* Targ. Toz.)	Lija	Wheeler, 1957 (suggesting tentative identification as *Colletotrichum trichellum* f. sp. *arisari* Pat.).

		Bidnija (February 2006)	
Colletotrichum sp.	Canary Island date palm (*Phoenix canariensis* hort. ex Chabaud)	Burmarrad	Brooks, 1998b
Colletotrichum sp.	Orange (*Citrus sinensis* Osbeck)	Rabat	Brooks, 1998b
Coniothecium sp. Sooty mould	Orange (*Citrus sinensis* Osbeck)	Siġġiewi	Wheeler, 1957
Coniothyrium sp.	English ivy (*Hedera helix* L.)	Buskett	Brooks, 1998b
Coriolopsis aspera (Jungh) Teng.	Carob (*Ceratonia siliqua* L.)	Maqluba	Briffa, 2002a
Cylindrocarpon sp.	Grapevine (*Vitis* sp.)	Luqa (St Vincent de Paul Residence nursery) (June 2005)	Isolated from rotted base of cuttings failing to radicate
	Olive (*Olea europaea* L.)	Mdina (August 2005)	Associated with root-rot of dying trees. *F. solani* also present
Cytospora punica Sacc. Die-back	Pomegranate (*Punica granatum* L.)	Mtaħleb	Wheeler, 1957. Also reported by Saccardo, 1914
Diaporthe citri F. A. Wolf	Orange (*Citrus sinensis* Osbeck)	Żebbuġ (December 2005)	*Phomopsis citri* stade only observed. *P. citri* was reported as frequent by Saccardo, 1912
Diatrypella quercina (Pers.) Cooke	English oak (*Quercus robur* L.)	Msida (January 2006, E106)	
Didymosphaeria sarmenti (Cooke & Harkn.) Berl. & Voglino	Grapevine (*Vitis vinifera* L.)	Fiddien	Wheeler, 1957 (on bark)
Diplodia sp. Leaf blight	Loquat [*Eriobotrya japonica* (Thunb.) Lindl.]	Buskett	Wheeler, 1957

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Entyloma calendulae (Oudem.) de Bary. White smut	Marigold (*Calendula officinalis* L.)	San Anton	Wheeler, 1957
Erysiphe cichoracearum f. *helianthi* Jacz. Powdery mildew	Sunflower (*Helianthus annuus* L.)	Għammieri (May 2005, E44)	
Erysiphe heraclei DC. Powdery mildew	Parsley [*Petroselinum crispum* (P. Mill) Nyman ex A.W. Hill]	Not known	Brooks, 1998b
	Carrot [*Daucus carota* L. ssp. *sativus* (Hoffm.) Arcang.]	San Anton	Wheeler 1994b
Erysiphe sp. Powdery mildew	Oat (*Avena sterilis* L.)	Pwales	Wheeler, 1957
	Littleseed canarygrass (*Phalaris minor* Rez.)	Chadwick Lakes	Wheeler, 1957
	Pea (*Pisum sativum* L.)	Chadwick Lakes, Fiddien	Wheeler, 1957 (*Oidium* state usually found)
		San Ġwann (May 2005, E38)	Only oidial state observed
	Spanish sanfoin (*Hedisarum coronarium* L.)	Buskett, Siġġiewi	Wheeler, 1957. He has observed only the oidial state and gives *E. polygoni* as probable species identification
		San Ġwann (May 2005, E39)	Only oidial state observed
	Tomato (*Solanum lycopersicum* L.)	Xewkija (Gozo)	Wheeler 1994b. Possibly *Oidium neolycopersici* L. Kiss

Eutypella scoparia (Schwein.) Ellis & Everh.	Ash (*Fraxinus oxycarpae* Bieb.)	Buskett	Wheeler, 1957 [as *Peroneutypa heteracantha* (Sacc.) Berl., on dead roots]
Fusarium coeruleum Lib. ex Sacc. [syn.: *F. solani* (Mart.) Sacc. var. *coeruleum* (Lib. ex Sacc.) C. Booth]. Potato rot	Potato (*Solanum tuberosum* L.)	Naxxar (December 2005)	On seed potato, cv Derby, imported from The Netherland. Sample forwarded by G. Carbone
Fusarium oxysporum Schltdl.	Olive (*Olea europaea* L.)	Dingli	Brooks, 1998b
	Strawberry *(Fragaria* × *ananassa* Duch.)	Dingli	Brooks, 1998b
F. oxysporum f. sp. *cepae* W. C. Snyder & H. N. Hansen, Basal rot	Onion (*Allium cepa* L.)	Żebbug	Brooks, 1998b
F. oxysporum f. sp. *dianthi* W. C. Snyder & H. N. Hansen. Wilt	Carnation (*Dianthus caryophyllus* L.)	Għammieri, not known, Qormi, Żabbar	Brooks, 1998b
F. oxysporum f. sp. *lycopersici* W. C. Snyder & H. N. Hansen. Wilt	Tomato (*Solanum lycopersicum* L.)	Dingli, Għammieri, Xewkija	Brooks, 1998b
		Not known	Collingwood, 1971
F. oxysporum f. sp. *melonis* W. C. Snyder & H. N. Hansen. Wilt	Melon (*Cucumis melo* L.)	Żejtun	Brooks, 1994b
F. oxysporum f. sp. *niveum* W. C. Snyder & H. N. Hansen. Wilt	Watermelon [*Citrullus lanatus* (Thumb.) Matsumura & Nakai]	Mġarr	Wheeler, 1994b [as "*F. oxysporum* f. sp. *melonis* (?)"]
		Kalkara, Siġġiewi, Żejtun	Brooks, 1998b

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
F. oxysporum f. sp. *radicis-lycopersici* Jarvis & Shoemaker. Crown and root rot	Tomato (*Solanum lycopersicum* L.)	Attard (January 2005), Bidnija (Mosta, December 2004), Burmarrad (November 2004, F5, F8), Dingli (January 2005), Mġarr (December 2004), Rabat (November 2005) St Paul's Bay (February 2005), Wardija (November 2004), Żabbar (December 2004)	Porta-Puglia and Mifsud, 2005b; Porta-Puglia *et al*. 2005
Fusarium sp.	Carnation (*Dianthus caryophyllus* L.)	Not known	Collingwood, 1972 (as *Fusarium roseum*). According to Wheeler (1994a) it was probably *F. culmorum*
Fusarium sp.	Cauliflower (*Brassica oleracea* L. var. *botrytis* L.)	Rabat	Brooks, 1998b
Fusarium sp.	Durum wheat (*Triticum durum* Desf.)	Għammieri	Wheeler, 1957 (associated with root and foot rot)
Fusarium sp.	GF-677 rootstock (*Prunus amygdalus* × *Prunus persica*)	Mġarr (November 2005)	
Fusicoccum amygdali Delacr. Branch and twig canker	GF-677 rootstock (*Prunus amygdalus* × *Prunus persica*)	Buskett (March 2005)	Severe damages observed on young plants at grafting
	Nectarine (*Prunus persica* Batsch.)	Wied tal-Isqof (June 2004), Siġġiewi (July 2004)	

Ganoderma lucidum (Curtis) P. Karst.	Pecan [*Carya illinoiensis* (Wagenh.) K. Koch]	Buskett (July 2004)	
	Holly oak (*Quercus ilex* L.)	Ta' Xbiex (July 2004)	
Ganoderma sp.	Nectarine (*Prunus persica* Batsch.)	Mdina (August 2004)	
Geotrichum candidum Link var. *candidum* [syn.: *Oospora citri-aurantii* (Ferraris) Sacc. & Sidow.]	Nectarine (*Prunus persica* Batsch.)	Mdina (July 2004)	Affected fruits were often colonised by insects on the tree (*Euparaea luteola* and *Carpophylus mutilatus*) or on the soil (*E. luteola*, *C. mutilatus*, *Carpophylus hemipterus* and *Urophorus humeralis*)
Gibberella intricans Wollenw. Root-rot	Tomato (*Solanum lycopersicum* L.)	Sliema	Wheeler, 1957 [as *Fusarium equiseti* (Corda) Sacc., isolated from roots of wilted plants but its pathogenicity has not been established]
	Marrow (*Cucurbita pepo* L.)	Gozo	Wheeler, 1957 [as *Fusarium equiseti* (Corda) Sacc.]
Gliocladium vermoesenii (Biourge) Thom	Washington fan palm (*Washingtonia robusta* H. Wendl.)	Gozo	Brooks, 1998b
Glomerella cingulata (Stoneman) Spauld. & H. Schrenk	Orange (*Citrus sinensis* Osbeck)	Rabat (March 2005, E31), Siġġiewi (April 2004), Żebbuġ (December 2005)	On leaves and twigs. Only the anamorph (*Colletotrichum gloeosporioides* Penz.) was observed
	Bay-laurel (*Laurus nobilis* L.)	Burmarrad (October 2005)	In a nursery. Only anamorph observed
Graphiola phoenicis (Moug.) Poit. Leaf scab	Dwarf fan palm (*Chamaerops humilis* L.)	Lija	Wheeler, 1994a

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
	Washington fan palm (*Washingtonia robusta* H. Wendl.)	Government Nursery, Gozo	Brooks, 1998b
Helminthosporium solani Durieu & Mont. Silver scurf	Potato (*Solanum tuberosum* L.)	Siġġiewi (March 2005, F11)	On potato 'Alpha', in two fields
Hypomyces rosellus (Alb. & Schwein.) Tul. & C. Tul.	Mushroom [*Agaricus bisporus* (J.E. Lange) Pilát]	Magħtab, Mtarfa	Brooks, 1998b
Inonotus indicus (Mass.) Pieri & Rivoire [syn.: *Aurificaria indica* (Mass.) D. A. Reid]	Carob (*Ceratonia siliqua* L.)	Not known	Pieri et Rivoire, 1996
Inonotus tamaricis (Pat.) Maire	Tamarix (*Tamarix africana* Poir.)	St. Paul's Bay (June 2005), Sliema and Ta' Xbiex (both February 2006)	Identified by E. Motta, CRA-ISPaVe, Rome, Italy
Laetiporus sulfureus (Bull.) Murill	Carob (*Ceratonia siliqua* L.)	Rabat (September 2005, E102)	
Lasiodiplodia theobromae (Pat.) Griffon & Maubl.	Pear (*Pyrus communis* L.) 'Bambinella'	Not known	Brooks, 1998b
	Loquat [*Eriobotrya japonica* (Thunb.) Lindl.]	Lija, San Pawl tat-Targa	Brooks, 1998b
	Holm oak (*Quercus ilex* L.)	Buskett	Brooks, 1998b
	Melon (*Cucumis melo* L.)	St. Paul's Bay (April 2005, E34)	Isolated rom wilting seedlings

Leptoshaeria maculans (Desm.) Ces. & de Not. Blackleg	Cabbage (*Brassica oleracea* L. var. *capitata* L.)	Birkirkara, Qormi	Wheeler, 1957 (as *Phoma lingam* Desm.)
Leptoshaeria modesta (Desm.) P. Karst.	Spiny chicory (*Cichorium spinosum* L.)	Gnejna	Wheeler, 1957
Leveillula taurica (Lév.) G. Arnaud. Powdery mildew	Aubergine (*Solanum melongena* L.)	Naxxar	Wheeler, 1994b. Reported as *Erysiphe taurica* Lév. on globe artichoke and on *Phlomidis fruticosa* (Saccardo 1912), and on *Carlina lanata* (Saccardo 1915)
	Globe artichoke (*Cynara scolymus* L.)	Mtarfa (June 2005, E45), St Paul Ta' Qlejja (May 2005, E43)	*Exiccata* dated around 1920s are present at the Argotti Botanical Garden Herbarium, Floriana
	Gazania (*Gazania* sp.)	Santa Lucija (June 2005, E48)	
	Pepper (*Capsicum annuum* L.)	Naxxar	Wheeler, 1994b
		Dingli (February 2005, E30), St Paul's Bay (January 2006, E110)	
	Tomato (*Solanum lycopersicum* L.)	Għammieri, not known	Brooks, 1998b
		Mġarr (October 2004, E20), Wardija (September 2004)	
Macrophoma sp.	Grapevine (*Vitis vinifera* L.)	Luqa	Brooks, 1998b
Macrophomina phaseolina (Tassi) Goid. Charcoal rot	Olive (*Olea europaea* L.)	Mdina (August 2005, E64)	Associated to rotted roots of young trees (*Nectria haematococca* and *Cylindrocarpon* sp. were also isolated)
Melampsora euphorbiae (Schub.) Castagne. Rust	Sunspurge (*Euphorbia helioscopia* L.)	Mtaħleb	Wheeler, 1957

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Melampsora euphorbiae-gerardianae W. Muell. Rust	Petty spurge (*Euphorbia peplus* L.)	San Anton	Wheeler, 1957
Melampsora populnea (Pers.) P. Karst. Rust	White poplar (*Populus alba* L.)	Buskett, Chadwick Lakes	Wheeler, 1957 (as *Melampsora tremulae* Tul.)
Melampsora pulcherrima Maire. Rust	Annual mercury (*Mercurialis annua* L.)	Buskett	Wheeler, 1957
		Bidnija (February 2006)	
Microdiplodia pruni Died. Die-back	Peach (*Prunus persica* Batsch)	Rabat	Wheeler, 1957
Microdiplodia salicis Died.	White poplar (*Populus alba* L.)	Buskett (?), Chadwick Lakes (?)	Wheeeler, 1957 (on bark)
Microsphaera euonymi-japonici Vienn.-Bourg. Powdery mildew	Japanese spindletree (*Euonymus japonicus* Thunb.)	San Anton	Weeler, 1994b
Monilinia fructigena Honey. Fruit-rot	Peach (*Prunus persica* Batsch)	Rabat	Brooks, 1998b
Mycogone sp.	Mushroom [*Agaricus bisporus* (J.E. Lange) Pilát]	Rabat	Brooks, 1998b
Mycosphaerella brassicicola (Duby) Lindau. Ring spot	Cabbage (*Brassica oleracea* L. var. *capitata* L.)	Birkirkara-Qormi	Wheeler, 1957 [as *Mycosphaerella brassicicola* (Duby) Johnson & Oud. Conidial state only]
	Cauliflower (*Brassica oleracea* L. var. *botrytis* L.)	Birkirkara-Qormi	Wheeler, 1957
	Kohlrabi (*Brassica oleracea* L. var. *gongyloides* L.)	Attard, Birkirkara-Qormi	Wheeler, 1957 (conidial state only)

Mycosphaerella fragariae (Tul.) Lindau. Leaf spot	Strawberry (*Fragaria* × *ananassa* Duch.)	Żabbar (February 2005, E28)	Ramularia stage only observed. *Ramularia tulasnei* reported by Saccardo, 1912
Mycosphaerella mori (Fuckel) F. A. Wolf. Leaf spot	Black mulberry (*Morus nigra* L.)	Binġemma, Buskett	Wheeler, 1957 [as *Phleospora mori* (Lév.) Sacc.]
	White mulberry (*Morus alba* L.)	Attard (October 2004)	
Mycosphaerella pinodes (Berk. & A. Bloxam) Vestergr. Blight	Pea (*Pisum sativum* L.)	Żabbar	Wheeler, 1957
Mycovellosiella fulva (Cooke) Arx [syn.: *Fulvia fulva* (Cooke) Cif.]. Leaf mould	Tomato (*Solanum lycopersicum* L.)	Not known	Collingwood, 1971 (as *Cladosporium fulvum*) and 1972
		Not known	Brooks, 1998b (as *Cladosporium fulvum*)
		Xewkija	Wheeler, 1994 (as *Fulvia fulva*)
		Għammieri (April 2004, F12, and January 2006)	
Myrothecium roridum Tode. Leaf blight and shot hole	GF-677 rootstock (*Prunus amygdalus* × *Prunus persica*)	Lija (July 2005, E54, E59, E70)	Koch's postulates confirmed, leaf blight or shot-hole symptoms reproduced on inoculated leaves (Porta-Puglia, unpublished; Fig. 4E)
	Bay-laurel (*Laurus nobilis* L.)	Wied Inċita (October 2005)	Isolated from leaves affected by apical necroses attributable to physiological disorders
Nectria episphaeria (?) (Tode) Fr.	Citrus (*Citrus* sp.)	San Anton	Brooks, 1998b (as "*Fusarium episphaeria*, tentative identification")

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Nectria haematococca Berk. & Broome	Broad bean (*Vicia faba* L.)	Bir id-Deħeb	Brooks, 1998b (as *Fusarium solani*)
	GF-677 rootstock (*Prunus amygdalus* × *Prunus persica*)	Mosta (August 2004)	Associated to root-rot on dying trees
	Olive (*Olea europaea* L.)	Mdina (August 2005, E62)	Associated to root-rot on dying trees. *Macrophomina phaseolina* and *Cylindrocarpon* sp. also present
	Potato (*Solanum tuberosum* L.)	Kirkop, St Andrews	Brooks, 1998b (as *Fusarium solani*)
	Strawberry (*Fragaria* × *ananassa* Duch.)	Marsascala	Brooks, 1998b (as *Fusarium solani*)
	Tomato (*Solanum lycopersicum* L.)	Għammieri	Brooks, 1998b (as *Fusarium solani*)
Nectria heterosperma Kalchbr. & Cooke. Canker	Orange (*Citrus sinensis* Osbeck)	San Anton	Wheeler, 1957
Oidium sp. Powdery mildew	Alexanders (*Smyrnium olusatrum* L.)	Mtaħleb	Wheeler, 1957
	Apple (*Malus domestica* Borkh.)	Binġemma, Mtħaleb	Wheeler, 1957 (uncommon, often followed by secondary invaders, e. g. *Cladosporium* sp.)
	Apricot (*Prunus armeniaca* L.)	Wied tal-Mistra	Wheeler, 1957
	Barley (*Hordeum vulgare* L.)	Birkirkara-Qormi, Għammieri	Wheeler, 1957 ("probably the oidial state of *Erysiphe cichoracearum*")

	Field bindweed (*Convolvolus arvensis* L.)	Għammieri (June 2005, E51)	Probably the oidial state of *Erysiphe convolvuli* var. *convolvuli* according to appressoria morphology
	Bitter vetch [*Vicia ervilia* (L.) Willd.]	Dingli	Wheeler, 1957
	Musk storksbill (?) (*Erodium* sp.)	Gozo	Wheeler, 1957, host tentatively identified as *Erodium moschatum* (L.) L'Hér.
	Henbit deadnettle (*Lamium amplexicaule* L.)	Għammieri	Wheeler, 1957
	Birdsfoot trefoil (*Lotus ornithopodioides* L.)	Girgenti	Wheeler, 1957
	English oak (*Quercus robur* L.)	Buskett	Wheeler, 1957
		Buskett (September 2005, E68)	
	Marrow (*Cucurbita pepo* L.)	Mosta	Wheeler, 1957
		Gozo (May 2005)	
	Marigold (*Calendula officinalis* L.)	Għammieri (December 2005, E95)	
	Rose (*Rosa* L.)	Lija	Wheeler, 1957
	Strawberry clover (*Trifolium fragiferum* L.)	Fiddien	Wheeler, 1957
Otthia spireae (Fuckel) Fuckel	White poplar (*Populus alba* L.)	Chadwick Lakes, Buskett	Wheeler, 1957 (on bark, also found associated to die-back of branches at Buskett)

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Passalora depressa (Berk.) Sacc. Leaf spot	Parsley [*Petroselinum crispum* (P. Mill) Nyman ex A.W. Hill]	Rabat	Wheeler, 1957 [as *Passalora depressa* (Berk. & Br.) v. Höhnel.]
Penicillium citrinum Thom. Fruit-rot	Lemon (*Citrus limon* Burm.)	Gozo	Wheeler, 1957 (as *Penicillium steckii* Zaleskii, "probably secondary invader")
Penicillium digitatum (Pers.) Sacc. Fruit-rot (blue mould)	Lemon (*Citrus limon* Burm.)	Gozo, very common	Wheeler, 1957. Mentioned as widespread on Citrus by Brooks (1998b) and frequently observed by us on Citrus fruits on the market
	Orange (*Citrus sinensis* Osbeck)	Very common	Wheeler, 1957
Penicillium italicum Wehmer. Fruit-rot (green mould)	Lemon (*Citrus limon* Burm.)	Siġġiewi (December 2004)	Wheeler, 1957. Mentioned as widespread on Citrus by Brooks (1998b) and frequently observed by us on Citrus fruits on the market
	Orange (*Citrus sinensis* Osbeck)	Very common	Wheeler, 1957
Pestalotiopsis funerea (Desm.) Steyaert	Strawberry (*Fragaria* × *ananassa* Duch.)	Wardija (November 2004)	
Pestalotiopsis maculans (Corda) Nag Raj	Strawberry tree (*Arbutus unedo* L.)	San Ġwann (October 2005)	Isolated from leaf spots
	Melon (*Cucumis melo* L.)	St Paul's Bay (April 2005)	Isolated from young seedlings in a nursery

Pheoramularia periclymeni (G. Winter) Deighton	Honeysuckle (*Lonicera implexa* Aiton)	Binġemma	Wheeler, 1957 (as *Cercospora periclymeni* Winter)
Phoma hedericola (Durieu & Mont.) Boerema. Leaf spot	English ivy (*Hedera helix* L.)	Buskett	Wheeler, 1957 (as *Phyllosticta hedericola* Dur. & Mont.)
		San Anton (January 2006, E109)	
Phoma tersa Sacc. [syn.: *Phomopsis tersa* (Sacc.) B. Sutton]	Passion fruit (*Passiflora edulis* Sims)	Gozo	Wheeler, 1957 (on dead wood)
Phomopsis viticola (Sacc.) Sacc.	Grapevine (*Vitis vinifera* L.)	Lija	Wheeler, 1957 (as *Diplodia viticola* Desm., on bark)
Paraphaeosphaeria glaucopunctata (Grev.) Shoemaker & C. E. Babc. [syn.: *Phaeosphaeriopsis glauco-punctata* (Grev.) M. P. S. Câmara, M. E. Palm & A. W. Ramaley]	Butcher's broom (*Ruscus aculeatus* L.)	Lija	Wheeler, 1957 as [*Leptosphaeria rusci* (Wallr.) Sacc., on dead cladodes]
	Dutch butcher's broom (*Ruscus hypophyllum* L.)	Lija	Wheeler, 1957 (on dead cladodes)
Phellinus pomaceus (Pers.) Maire. Wood decay	Peach (*Prunus persica* Batsch)	Binġemma	Wheeler, 1957 [as *Fomes pomaceus* (Pers.) Lloyd]
		Qrendi (April 2005)	Identified by T. Annesi, CRA-ISPaVe, Rome, Italy
Phragmidium mucronatum (Pers.) Schltd. Rust	Rose (*Rosa* sp.)	Mosta, Pwales, Rabat. Common throughout the Island	Wheeler, 1957

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Phragmidium sanguisorbae (DC.) J. Schröt. Rust	Small burnet [*Sanguisorba minor* Scop. ssp. *muricata* (Spach) Nordborg, syn.: *Poterium polygamum* Waldstr. & Kit.]	Buskett	Wheeler, 1957
Phragmidium violaceum (Schultz) G. Winter. Rust	Blackberry (*Rubus ulmifolius* Schott)	Girgenti	Wheeler, 1957
		Mtarfa (June 2005, E46)	
Phyllachora sp. Tar spot	Spanish sainfoin (*Hedisarum coronarium* L.)	Attard, Gozo, Rabat, Ta' Qali	Wheeler, 1957 describes the pathogen as a possibly undescribed species, very common, causing tar spots, frequently associated with Cercospora leaf spots
Phyllosticta sp.	English ivy (*Hedera helix* L.)	Buskett	Brooks, 1998b
Phyllosticta sp.	Dutch butcher's broom *(Ruscus hypophyllum* L.)	Lija	Wheeler, 1957
Pleospora herbarum (Pers.) Rabenh.	Onion (*Allium cepa* L.)	Għammieri	Wheeler, 1957 (secondary invader)
	Endive (*Cichorium endivia* L.)	Pwales	Wheeler, 1957 (secondary invader)
Fruit-rot	Lemon (*Citrus limon* Burm.)	Gozo	Wheeler, 1957
Leaf spot	Lettuce (*Lactuca sativa* L.)	Buskett	Wheeler. 1957. Possibly *P. herbarum* f. *lactucum* Padhi & Snyder

	Oleander (*Nerium oleander* L.)	Gozo	Wheeler, 1957
	Potato (*Solanum tuberosum* L.)	Dingli (March 2005)	
Pleospora vitis Catt. Leaf spot	Grapevine (*Vitis vinifera* L.)	Lija	Wheeler, 1957 (on bark)
Pleospora sp. Leaf blight	Japanese spindletree (*Euonymus japonicus* Thunb.)	San Anton	Wheeler, 1957
Pleospora sp. Leaf spot	Honeysuckle (*Lonicera implexa* Aiton)	Wardija (December 2004)	Anamorph attributable to *Stemphylium vesicarium* (Wallr.) E. G. Simmons
Pleospora sp.	Spanish sainfoin *(Hedisarum coronarium* L.)	Għammieri	Wheeler, 1957 (on withered stems)
Pseudocercospora ceratoniae (Pat. & Taubenh.) Deighton. Leaf spot	Carob tree (*Ceratonia siliqua* L.)	Wardija (November 2004, E22, E60, E73)	Described as *Cercospora ceratoniae* Sacc. sp. n. in Saccardo, 1915. *Cercospora* sp. reported in Wheeler (1957) on carob. Koch's postulates confirmed on young seedlings (Porta-Puglia, unpublished)
Pseudocercospora vitis (Lév.) Speg.	Grapevine (*Vitis vinifera* L.)	Selmun	Wheeler, 1957
Pseudopeziza medicaginis (Lib.) Sacc. Leaf spot	Lucerne (*Medicago sativa* L.)	Għammieri	Wheeler, 1957. Also reported in Saccardo, 1915
Pseudovalsa longipes (Tul.) Sacc.	Kermes oak (*Quercus coccifera* L.)	San Anton	Wheeler, 1957 (on bark)
Puccinia allii (DC.) F. Rudolphi. Rust	*Allium* sp.	Fiddien	Wheeler, 1957
	Garlic (*Allium sativum* L.)	Pwales, Ta' Qali, Wied tal-Mistra; very common	Wheeler, 1957. *Puccinia allii* DC. reported in Saccardo, 1912

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
		Unknown (collected at *Pitkalija* Market, March 2004, E6), Qormi (April 2005, E35)	Widespread. Frequently observed at *Pitkalija* market
	Onion (*Allium cepa* L.)	Wied tal-Mistra	Wheeler, 1957
		Buskett, Girgenti, Żejtun	Brooks, 1998b
		San Ġwann (May 2005), Żabbar (March 2004)	Frequently observed at *Pitkalija* market and greengrocers' shops
Puccinia antirrhini Dietel & Holw. Rust	Snapdragon (*Antirrhinum majus* L.)	Sliema	Wheeler, 1957
		Għammieri	Brooks, 1998b
Puccinia carthami Corda. Rust	Safflower (*Carthamus tinctorius L.*)	Chadwick Lakes, Wied-iz-Żurrieq	Wheeler, 1957
Puccinia coronata Corda. Rust	Oat (*Avena sterilis* L.)	Chadwick Lakes	Wheeler, 1957
Puccinia galactitis P. Syd. & Syd. Rust	Boar thistle (*Galactites tomentosa* Moench.)	Chadwick Lakes	Wheeler, 1957
Puccinia gladioli Castagne. Rust	Italian gladiolus (*Gladiolus italicus* P. Mill, syn.: *Gladiolus segetum* Ker-Gawl.)	Buskett	Wheeler, 1957; Collingwood, 1970. Also reported in Saccardo, 1914

Puccinia glomerata Grev. Rust	Groundsel (*Senecio vulgaris* L.)	Żabbar (February 2005, E29)	On this host Saccardo (1912) reported a rust caused by *Coleosporium tussilaginis* f. sp. *senecionis-silvatici* Boerema & Verh. [as *Coelosporium senecionis* (Pers.) Fr.]
Puccinia graminis Pers. subsp. *graminis* f. sp. *tritici* Erikss. & Henning. Black stem rust	Durum wheat (*Triticum durum* Desf.)	Għammieri	Wheeler, 1957 (as *Puccinia graminis* Pers.). Saccardo (1912) reported *Puccinia graminis* Pers. on *Dactylis* and *Setaria*
	Wheat (*Triticum* sp.)	Buskett	Brooks, 1998b.
	Barley (*Hordeum vulgare* L.)	Rabat, Żebbuġ	Wheeler, 1957
Puccinia helianthi Schwein. Rust	Sunflower (*Helianthus annuus* L.)	Gozo	Wheeler, 1957
Puccinia hieracii var. *hieracii (*Röhl.) H. Mart. Rust	Endive (*Cichorium endivia* L.)	Għammieri, Pwales	Wheeler, 1957 [as *Puccinia cichorii* (DC) Bell]
	Spiny chicory (*Cichorium spinosum* L.)	Ġnejna	Wheeler, 1957
Puccinia hordei G. H. Otth. Rust	Barley (*Hordeum vulgare* L.)	Buskett, Marsaxlokk	Brooks, 1998b
	Wall barley [*Hordeum murinum* spp. *leporinum* (Link) Arcang.]	Rabat, Żebbuġ	Wheeler, 1957
	Annual junegrass *Rostraria cristata* (L.) Tzvelev, [syn.: *Koeleria phleoides* (Vill.) Pers.]	Buskett, Għammieri	Wheeler, 1957 (as *Puccinia schismi* Bubak)
Puccinia horiana Henn. White rust	Chrysanthemum (*Chrysanthemum* × *morifolium* Ramat.)	Ta' Qali, Żabbar	Brooks, 1998a (details of outbreaks are given)

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
		Għaxaq (May 2005, E42)	
Puccinia malvacearum Bertero ex Mont. Rust	Mallow (*Malva silvestris* L.)	Għammieri, Gozo	Wheeler, 1957. Reported on *Lavatera cretica* and *Malva silvestris* by Saccardo, 1915
		Blata l-Bajda (January 2006, E98), Burmarrad, Buskett (March 2005), Għammieri (January 2006), Marsa (January 2006), Siġġiewi (February 2006)	Rather common
Puccinia menthae Pers. Rust	Mint (*Mentha* sp.)	Għammieri	Wheeler, 1957. Also reported by Saccardo on *Mentha viridis (*1912) and on *Origanum majorana* (1915)
Puccinia pelargonii-zonalis Doidge. Rust	Pelargonium (*Pelargonium* sp.)	Xewkija (Gozo),	Brooks, 1998b. Mentioned as present in Malta also by Wheeler, 1994a
		Delimara, Mellieħa, Mġarr	Wheeler, 1994b
Puccinia smyrnii Biv. Rust	Alexanders (*Smyrnium olusatrum* L.)	Fiddien	Wheeler, 1957. As *Puccinia smyrnii-olusatri* in Saccardo, 1912
		Mġarr and Wied id-Dis (both February 2006)	Sample from Wied id-Dis collected by S. Mifsud
Puccinia sonchi Roh. [syn.: *Miyagia pseudosphaeria* (Mont.) Jørst.] Rust	Sowthistle (*Sonchus oleraceus* L.)	Għammieri	Wheeler, 1957. Also in Saccardo, 1912

Puccinia striiformis var. *striiformis* Westend. Yellow rust	Durum wheat (*Triticum durum* Desf.)	Għammieri	Wheeler, 1957 (as *Puccinia glumarum* Eriks. & E. Henn). Reported as *P. striiformis* by Brooks (1998b). Saccardo (1912) reports *Puccinia rubigo-vera* (DC.) Wint. on *Brachipodium*
		Bidnija, St. Thomas Bay (both February 2006)	
Pyrenophora graminea S. Ito & Kurib. Leaf stripe	Barley (*Hordeum vulgare* L.)	Buskett, Ta' Qali	Wheeler, 1957. As *Helminthosporium gramineum* Rabenh.
Pyrenophora teres Drechsler. Net blotch	Wall barley [*Hordeum murinum* spp. *leporinum* (Link) Arcang.]	Chadwick Lakes	Wheeler, 1957 (as agent of "leaf spot"). Reported as *Helminthosporium teres* Sacc. by Saccardo, 1915
		Għammieri (December 2005, E93)	
Ramularia arvensis Sacc. Leaf spot	Creeping cinquefoil (*Potentilla reptans* L.)	Mtaħleb	Wheeler, 1957
Ramularia menthicola Sacc.	Mint (*Mentha* sp.)	Għammieri	Wheeler, 1957
Ramularia parietariae Pass.	Wall pellitory (*Parietaria judaica* L., syn.: *Parietaria diffusa* Mert & Koch)	Buskett	Wheeler, 1957
Rhizopus stolonifer (Ehrenb. ex Fr.) Lind. Fruit-rot	Peach (*Prunus persica* Batsch)	Fiddien	Wheeler, 1957. We have frequently observed *R. stolonifer* on peach and nectarine fruits from the market
Rhizopus sp.	Courgette (*Cucurbita pepo* L.)	Għammieri	Brooks, 1998b
	Melon (*Cucumis melo* L.)	Żejtun	Brooks, 1998b
	Strawberry (*Fragaria* × *ananassa* Duch.)	Fairly widespread	Brooks, 1998b

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Rhynchosporium secalis (Oudem.) Davis Scald	Barley (*Hordeum vulgare* L.)	Buskett	Wheeler, 1994b
Rosellinia necatrix Berl. ex Prill. Root-rot	Almond (*Amygdalus communis* L.)	Siġġiewi	Wheeler, 1994b. Further investigation are needed to assess the species situation according to recent taxonomic findings
	Apricot (*Prunus armeniaca* L.)	Rabat (April and August 2004)	
	Apple (*Malus domestica* Borkh.)	Siġġiewi	Brooks, 1998b
	Peach (*Prunus persica* Batsch)	Siġġiewi	Wheeler, 1994b
		Dingli (May 2004), Mġarr (July 2005)	
	Pear (*Pyrus communis* L.)	Siġġiewi	Wheeler, 1994b
	Plum (*Prunus domestica* L.)	Għaxaq (October 2004)	
Sclerotinia sclerotiorum (Lib.) de Bary. Stem rot	Almond (*Amygdalus communis* L.)	Not known	Collingwood, 1972
	Aubergine (*Solanum melongena* L.)	Naxxar	Wheeler, 1994b
	Broad bean (*Vicia faba* L.)	Lija, Wied il-Għajn	Wheeler, 1994a

	Melon (*Cucumis melo* L.)	Mġarr	Brooks, 1998b
		Binġemma (May 2004)	
	Runner bean (*Phaseolus vulgaris* L.)	Not known	Collingwood, 1972
		Mosta (April 2004)	
	Pepper (*Capsicum annuum* L.)	Not known	Brooks, 1998b
		Magħtab (April 2005, F13)	
	Tomato (*Solanum lycopersicum* L.)	Mellieħa	Wheeler, 1957
		Burmarrad (February 2005, F10)	
Sclerotinia sp.	Broad bean (*Vicia faba* L.)	Wied il-Għajn	Wheeler, 1957
Septoria antirrhini Desm. Leaf spot	Snapdragon (*Antirrhinum majus* L.)	Marsa	Wheeler, 1957 (as *Septoria antirrhina* Rob. & Desm.). *Septoria anthirrini* Desm. is reported by Saccardo, 1915
Septoria apiicola Speg. Late blight	Celery [*Apium graveolens* L. var. *dulce* (Miller) Pers.]	Pwales, San Anton, Żabbar	As *Septoria apii* Chester (Wheeler, 1957). Reported in Saccardo (1914, 1915) as *Septoria petroselini* Desm. The latter reports also *S. petroselini* var. *apii* Br. & Cav. fm. *emaculata* Sacc.

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
		Mellieħa (March 2004, E4, and November 2005, E89), Mġarr (March 2004, E5)	In November 2005 (at Mellieħa) caused important losses on seedlings for transplant
		Mtarfa	Brooks, 1998b
Septoria convolvuli Desm. Leaf spot	Field bindweed (*Convolvolus arvensis* L.)	Għammieri	Wheeler, 1957
Septoria pastinacae Westend. Leaf spot	Parsnip (*Pastinaca sativa* L.)	Birkirkara-Qormi	Wheeler, 1957
Septoria petroselini Desm. Leaf spot	Parsley [*Petroselinum crispum* (P. Mill.) Nyman ex A.W. Hill]	Żabbar (March 2004, E3, and July 2005, E56)	Reported in Saccardo (1914, 1915) who reports also *S. petroselini* var. *apii* Br. & Cav. fm. *emaculata* Sacc. (all on celery)
Septoria piri I. Miyake. Leaf spot	Pear (*Pyrus communis* L.)	Chadwik Lakes	Wheeler, 1957 (recorded as fairly common but not on local var. Bambinella)
Septoria plantaginea Pass. Leaf spot	Sea plantain (*Plantago maritima* L.)	Gozo	Wheeler, 1957
Septoria urticae Roberge ex Desm. Leaf spot	Roman nettle (*Urtica pilulifera* L.)	Gozo	Wheeler, 1957
Sphaeropsis sp.	Cypress (*Cupressus sempervirens L.*)	Luqa (St Vincent de Paul Residence nursery)	Brooks, 1998b
Sphaceloma viburni Jenkins & Bitanc. Leaf spot	Laurustinus (*Viburnum tinus* L.)	Qormi (October 2004)	In a nursery

Sphaerotheca fuliginea (Schltdl.) Pollaci. Powdery mildew	Cucumber (*Cucumis sativus* L.)	Not known	Collingwood, 1972
		Żabbar	Brooks, 1998b
Sphaerotheca humuli (DC.) Burrill. [syn.: *Podosphaera macularis* (Wallr.) U. Braun & S. Takam.]. Powdery mildew	Marigold (*Calendula officinalis* L.)	Għammieri, San Anton	Wheeler, 1957
	Strawberry (*Fragaria* × *ananassa* Duch.)	Ras il-Wied (Wardija) (November 2005, E81)	Oidial stage only
Sphaerotheca pannosa Wallr. Lév. [syn.: *Podosphaera pannosa* (Wallr.) de Bary]. Powdery mildew	Rose (*Rosa* L.)	Għammieri, Gwardamanġa	Brooks, 1998b
Sphaerotheca pannosa var. *persicae* Woron. [syn.: *Podosphaera pannosa* (Wallr.) de Bary]. Powdery mildew	Peach (*Prunus persica* Batsch)	Chadwick Lakes, Dingli	Wheeler, 1994a. Mentioned among the most common causes of disease of fruit trees by Collingwood, 1972
		Binġemma, Mosta	Brooks, 1998b
		Chadwick Lakes (June 2005, E47), Mġarr (July 2005, E57), Sta Lucija (June 2004) St Paul Ta' Qlejja (June 2004)	
Spilocaea oleaginea (Castagne) S. Hughes. Peacock spot	Olive (*Olea europaea* L.)	Buskett	Wheeler, 1957
		Dingli (September 2005), Mġarr (May 2004), Santa Luċija (March 2004), Wardija (May 2005), Wied Ħas-Sabtan (March 2004, E9)	Widespread. Causing severe defoliation on some cvs

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Spilocaea pyracanthae (G. H. Otth) Arx [syn.: *Fusicladium eriobotryae* (Cavara) Sacc.]	Loquat [*Eriobotrya japonica* (Thunb.) Lindl.]	San Martin (St Paul's Bay) (April 2005, F12)	
Stemphylium vesicarium (Wallr.) E. G. Simmons	Citrus (*Citrus* sp.)	Dingli, Safi (both February 2005)	Isolated from lemon (Dingli) and orange (Safi) leaves showing blight of the distal end. Presence of the fungus was consistent (no pathogenicity tests were done)
	Onion (*Allium cepa* L.)	Rabat	Wheeler, 1957 [as *Pleospora allii* (Rabenh.) Ces. & de Not.]
		Burmarrad (February 2005)	
Stemphylium sp.	Cucumber (*Cucumis sativus* L.)	Żejtun	Brooks, 1998b
	Tomato (*Solanum lycopersicum* L.)	Żebbieħ	Brooks, 1998b
Taphrina deformans (Berk.) Tul. Leaf curl	Almond (*Amygdalus communis* L.)	Chadwick Lakes	Wheeler, 1957 (uncommon). Mentioned among the most common causes of disease of fruit trees by Collingwood (in Mazzocchi and Debattista, 1971)
	Peach (*Prunus persica* Batsch)	Gozo	Wheeler, 1957
		Binġemma, Lija	Brooks, 1998b

		Binġemma (May 2005), Chadwick Lakes (June 2005), Mtarfa (June 2005, F15), Rabat (April 2004, E15, and June 2005, E40), San Ġwann (May 2005), Siġġiewi (May 2004 and 2005)	
Thanatephorus cucumeris (A. B. Frank) Donk (anamorph: *Rhizoctonia solani* Kühn)	Aleppo pine (*Pinus halepensis* P. Mill.)	Żebbuġ	Brooks, 1998b
	Apple (*Malus domestica* Borkh.)	Birkirkara, Marsa (customs)	Brooks, 1998b (as *R. solani*)
	Araucaria (*Araucaria* sp)	Xewkija	Brooks, 1998b
	Aubergine (*Solanum melongena* L.)	Għammieri	Brooks, 1998b
	Carnation (*Dianthus caryophyllus* L.)	Għammieri	Brooks, 1998b
		Għaxaq (October 2004)	
	Cauliflower (*Brassica oleracea* L. var. *botrytis* L.)	Rabat, not known	Brooks, 1998b
	Chrysanthemum (*Chrysanthemum* × *morifolium* Ramat.)	Żabbar	Brooks, 1998b
	Citrus (*Citrus* sp.)	Birkirkara, Għammieri, San Anton, Xewkija, Żabbar	Brooks, 1998b
	Grapevine (*Vitis vinifera* L.)	Marsaxlokk	Brooks, 1998b
	Mint (*Mentha* L.)	Għammieri	Brooks, 1998b

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
	Olive (*Olea europaea* L.)	Dingli	Brooks, 1998b
	Onion (*Allium cepa* L.)	Siġġiewi, Żebbuġ	Brooks, 1998b
	Peach (*Prunus persica* Batsch)	Valletta	Brooks, 1998b
	Pepper (*Capsicum annuum* L.)	Għammieri, Marsa (Customs)	Brooks, 1998b
	Potato (*Solanum tuberosum* L.)	Siġġiewi (April 2004, F5), Wied tal-Isqof (February 2006)	Siġġiewi sample with Black scurf forwarded by V. Farrugia. Frequently observed on commercial potato tubers
	Strawberry (*Fragaria* × *ananassa* Duch.)	Fairly widespread: Dingli, Marsa (Customs), Marsascala, Mġarr	Brooks, 1998b
	Tomato (*Solanum lycopersicum* L.)	Għammieri	Brooks, 1998b
Thielaviopsis basicola (Berk. & Broome) Ferraris. Brown root-rot	GF-677 rootstock (*Prunus amygdalus* × *Prunus persica*)	Gudja (May 2005), Lija (December 2005, E96), Luqa (St Vincent de Paul Residence nursery) (April 2004)	Repeatedly observed on roots of young in vitro-produced plants and grafted rootstocks affected by brown rot at Lija and Luqa (St Vincent de Paul Residence nursery)
	Grapevine (*Vitis vinifera* L.)	Mosta (June 2004)	
	Haworthia (*Haworthia* sp.)	Żabbar (May 2004)	

	Myrobalan rootstock 29C (*Prunus cerasifera* Ehrh.)	Lija (E55), Luqa (St Vincent de Paul Residence nursery) (both October 2004)	
	Plum (*Prunus domestica* L.)	Rabat (May 2004)	
Tranzschelia pruni-spinosae var. *discolor* (Fuckel) Dunegan. Rust	Apricot (*Prunus armeniaca* L.)	Gozo, Wied tal-Mistra	Wheeler, 1957 [as *Tranzschelia discolor* (Fuckel) Trans & Litv.]
	Almond (*Amygdalus communis* L.)	Buskett, Fiddien, Gozo	Wheeler, 1957
		Mosta	Wheeler, 1994b
	Bitter almond (*Amygdalus communis* L.)	Chadwick Lakes	Wheeler, 1994a (on bitter almond rootstock)
	Cherry plum (*Prunus cerasifera* Ehrh.)	St Julian (January 2006, E99)	
	Peach (*Prunus persica* Batsch)	Gudja (September 2004, E19), Luqa (St Vincent de Paul Residence nursery) and Wardija (both November 2004)	
	Plum (*Prunus domestica* L.)	Gozo	Wheeler, 1957
		Lija	Brooks, 1998b. *Puccinia pruni-spinosae* Pers. on plum reported in Saccardo, 1915
	GF-677 rootstock (*Prunus amygdalus* × *Prunus persica*)	Luqa (St Vincent de Paul Residence nursery) (November 2004, E85), Mġarr (November 2004, E86)	

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Uncinula necator (Schwein.) Burrill (syn.: *Erysiphe necator* Schwein)	Grapevine (*Vitis vinifera* L.)	Birkirkara, Buskett, Gozo	Wheeler, 1957 [as *Oidium* sp., oidial state of *Uncinula necator* (Schw.) Baw.]. We also observed the oidial state only. Mentioned among the most common causes of disease of grape by Collingwood (in Mazzocchi and Debattista, 1971)
		Fawwara (July 2005)	
Uromyces anthyllidis (Grev.) J. Schröt. Rust	Sweetclover [*Melilotus indicus* (L.) All.]	Għammieri	Wheeler, 1957
Uromyces ciceris-arietini (Grognot) Jacz. & Boid. Rust	Chickpea (*Cicer arietinum* L.)	Pwales	Wheeler, 1957
Uromyces dianthi (Pers.) Niessl. Rust	Carnation (*Dianthus caryophyllus* L.)	Żabbar	Wheeler, 1957. The author mentions that in Malta *U. dianthi* is frequently found parasitised by *Eudarluca australis* Speg. (*Phaeospaeriaceae*)
		Not known	Collinwood, 1972
		Not known	Brooks, 1998b
Uromyces lineolatus (Desm.) J. Schröt. Rust	Club-rush (*Scirpus maritimus* L.)	Ġnejna	Wheeler, 1957
Uromyces pisi-sativi (Pers) Liro. Rust	Pea (*Pisum sativum* L.)	Fiddien	Wheeler, 1957 [As *Uromyces pisi* (DC.) Otth]
Uromyces polygoni-avicularis (Pers.) P. Karst. Rust	Common knot-grass (*Polygonum aviculare* L.)	Għammieri	Wheeler, 1957

Uromyces savulescui Rayss. Rust	Statice [*Limonium bonduellei* (T. Lestib.) Kuntze]	Żabbar	Wheeler, 1957
	Statice [*Limonium sinuatum* (L.) P. Mill.]	San Anton, Żabbar	Wheeler, 1957
Uromyces striatus J. Schröt. Rust	Lucerne (*Medicago sativa* L.)	Għammieri	Wheeler, 1957
Uromyces transversalis (Thüm.) G. Winter. Rust	Gladiolus (*Gladiolus* × *hortolanus*)	Not known	Collingwood, 1970. Mentioned as present in Malta also by Wheeler, 1994a
		Burmarrad	Brooks, 1998b
Uromyces trifolii-repentis (Castagne) Liro	Strawberry clover (*Trifolium fragiferum* L.)	Fiddien	Wheeler, 1957
Uromyces viciae-fabae (Pers.) J. Schröt. Rust	Broad bean (*Vicia faba* L.)	Għammieri, Gozo	Wheeler, 1957. As *Uromyces fabae* (Grev.) de Bary ex Cooke. *Uromyces fabae* (Pers.) de Bary reported by Saccardo (1912, 1914)
		Qrendi (April 2005, E37), Rabat (May 2005, E41) Wardija (April 2005, E36)	
	Pea (*Pisum sativum* L.)	Chadwick Lakes, Fiddien	Wheeler, 1957 as *Uromyces fabae* (Grev.) de Bary ex Cooke
	Common vetch (*Vicia sativa* L.)	Girgenti	Wheeler, 1957
Ustilago hordei (Pers.) Lagerh. Covered smut	Barley (*Hordeum vulgare* L.)	Girgenti, Rabat, Żabbar, Żebbug	Wheeler, 1957
Ustilago nuda f. sp. *hordei* Shaffnit. Loose smut	Barley (*Hordeum vulgare* L.)	Buskett, Ta' Qali, Żabbar	Wheeler, 1957 [as *Ustilago nuda* (Jens.) Rostr.]
Ustilago spegazzini Hirschh. var. *agrestis* (Syd.) G. W. Fisch. & Hirschh.	Esparto grass (*Lygeum spartum* Loefl. ex L.)	Ġneina	Wheeler, 1957

TBLE 3 - Continued

PATHOGENIC SPECIES AND DISEASES*	HOSTS**	LOCATIONS AND DATES	REFERENCES AND COMMENTS
Venturia carpophila E. E. Fisher	GF-677 rootstock (*Prunus amygdalus* × *Prunus persica*)	Luqa (St Vincent de Paul Residence nursery) (December 2004, E49)	Leaf-spots and shot-hole symptoms. Stem rotting around buds. Anamorph (*Cladosporium carpophylum*) only was observed
Venturia inaequalis (Cooke) G. Winter. Scab	Apple (*Malus domestica* Borkh.)	Lija	Brooks, 1998b. Mentioned among the most common causes of disease of fruit trees by Collingwood (in Mazzocchi and Debattista, 1971)
		Rabat	Wheeler, 1994a
Venturia pyrina Aderh. Scab	Pear (*Pyrus communis* L.)	Mtaħleb	Wheeler, 1957. Mentioned among the most common causes of disease of fruit trees by Collingwood (in Mazzocchi and Debattista, 1971)
		Not known	Brooks, 1998b
	Pear (*Pyrus communis* L.) 'Bambinella'	Siġġiewi (June 2004, F8)	
Verticillium dahliae Kleb. Wilt		Not known	Collingwood (1972) mentions the importance of *V. dahliae* in soil
	Aubergine (*Solanum melongena* L.)	St Paul's Bay	Wheeler, 1994b
		Balzan, St Paul's Bay, Żejtun	Brooks, 1998b
		Marsa (August 2004)	

	Grapevine (*Vitis vinifera* L.)	Marsaxlokk	Brooks, 1998b
	Melon (*Cucumis melo* L.)	Żejtun	Brooks, 1998b
	Binġemma (May 2004)		
	Olive (*Olea europaea* L.)	Very frequent***	Pace-Lupi, 2005; Porta-Puglia and Mifsud, 2005a
	Potato (*Solanum tuberosum* L.)	Ħal-Farruġ (January 2005)	Pace-Lupi *et al*, 2006
	Strawberry (*Fragaria* × *ananassa* Duch.)	Not known	Brooks, 1998b
	Tomato (*Solanum lycopersicum* L.)	Not known	Collingwood, 1971 and 1972. The Author states that Verticillium-wilt resistant cvs planted in various part of the Island have given disappointing results
		Marsa	Brooks, 1998b
Verticillium fungicola (Preuss) Hassebr. Dry bubble	Mushroom [*Agaricus bisporus* (J.E. Lange) Pilát]	Magħtab, Mtarfa, Tas-Salib	Brooks, 1998a, 1998b.

* Disease name is given when known or mentioned in the relevant report.

** Citrus species are listed under "*Citrus*" common name to facilitate immediate comparison among different findings/reports which often are limited to the genus. Common species name is given when known.

***Binġemma (May 2004), Birzebuġġa (August 2004), Comino Island (September 2004), Għammieri (May 2004, E16, and August 2004), Għaxaq (April 2004), Luqa (St Vincent de Paul Residence nursery) (May 2004), Mosta (April 2004 and March 2005), Melliħa (November 2005), Qormi (April 2005), Sant Paul Ta' Qlejja (Mars 2005), Siġġiewi (April 2005, E52), Ta' Qali (Mars 2005), Żebbuġ (April 2004, E11), Żabbar (March 2004, E10), Żebbieġħ (May 2004).

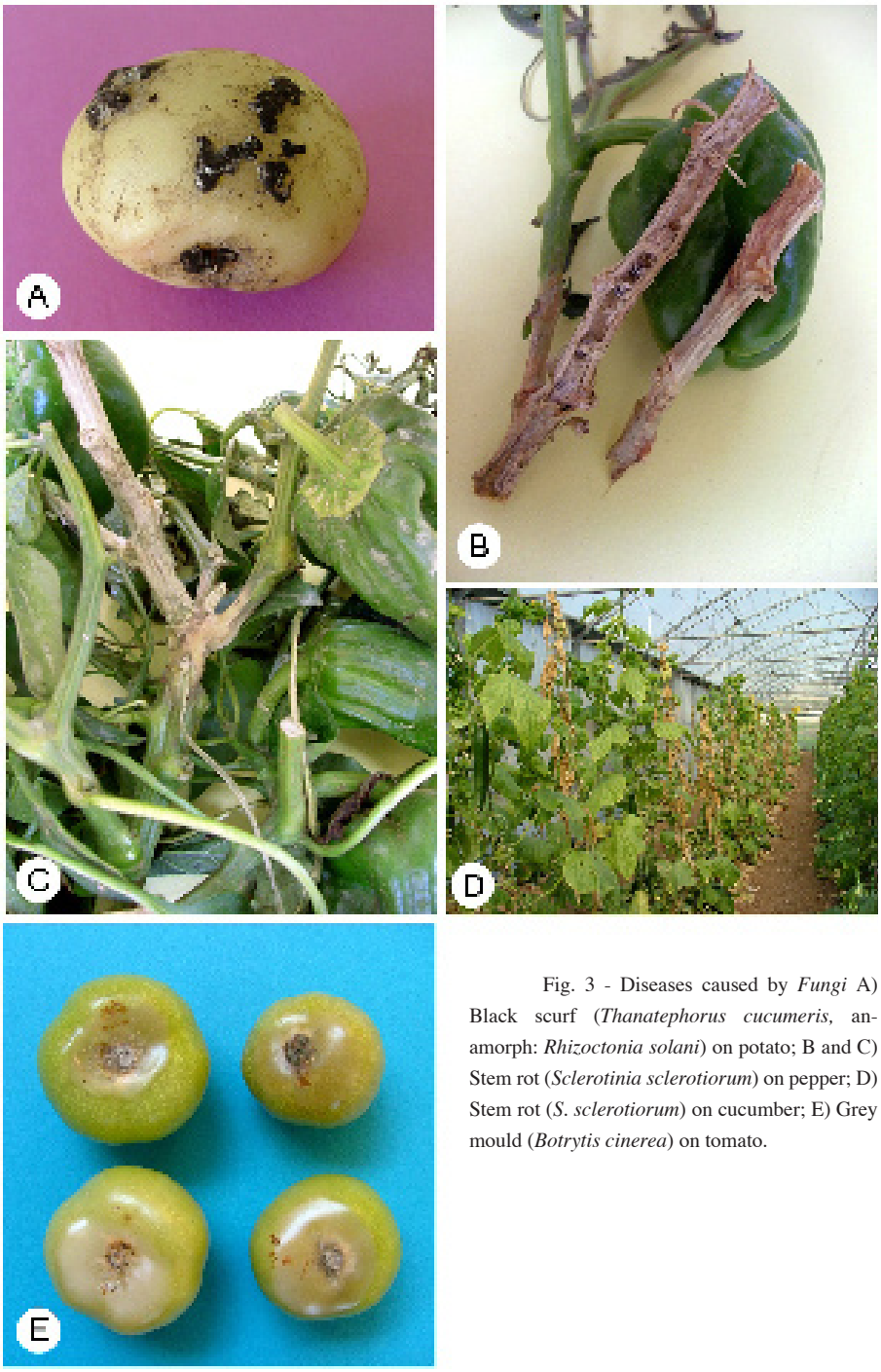


Fig. 3 - Diseases caused by *Fungi* A) Black scurf (*Thanatephorus cucumeris*, anamorph: *Rhizoctonia solani*) on potato; B and C) Stem rot (*Sclerotinia sclerotiorum*) on pepper; D) Stem rot (*S. sclerotiorum*) on cucumber; E) Grey mould (*Botrytis cinerea*) on tomato.

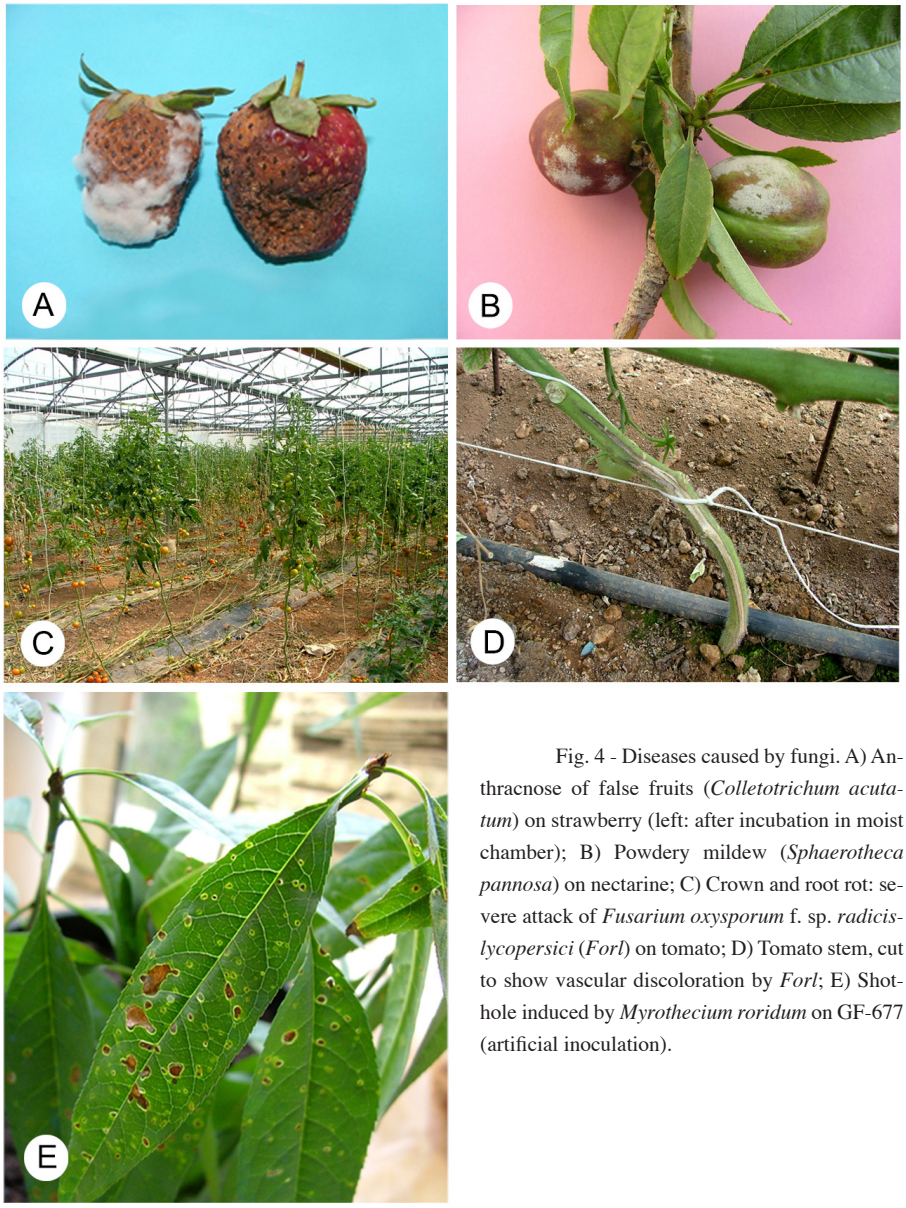
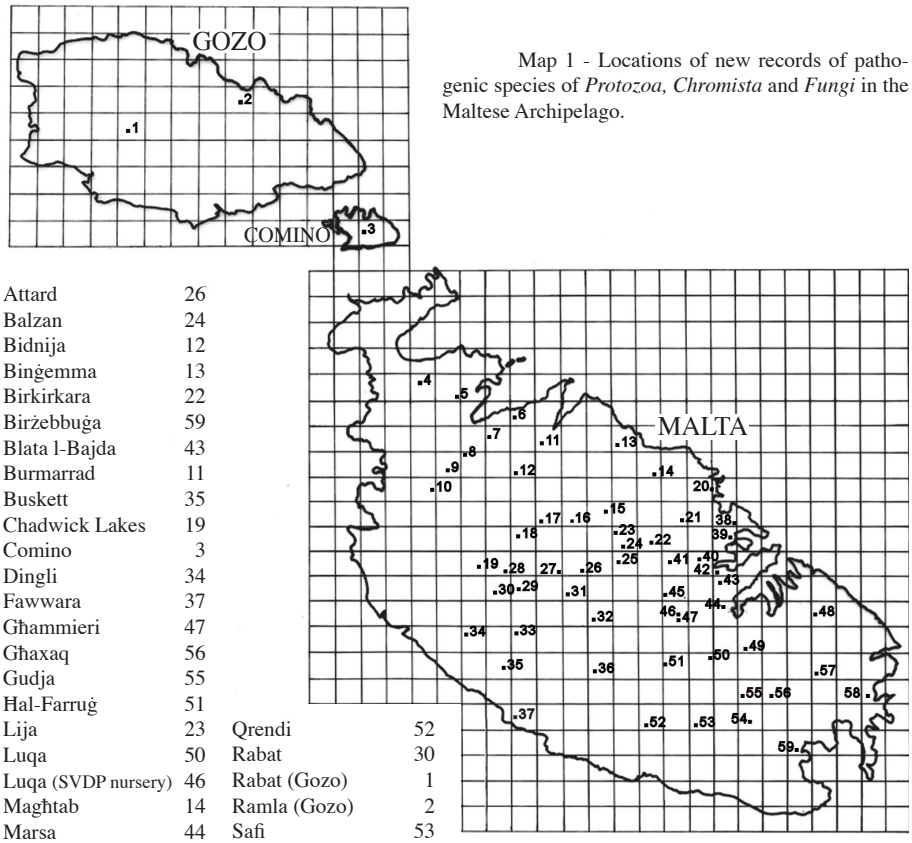


Fig. 4 - Diseases caused by fungi. A) Anthracnose of false fruits (*Colletotrichum acutatum*) on strawberry (left: after incubation in moist chamber); B) Powdery mildew (*Sphaerotheca pannosa*) on nectarine; C) Crown and root rot: severe attack of *Fusarium oxysporum* f. sp. *radicis-lycopersici* (*Forl*) on tomato; D) Tomato stem, cut to show vascular discoloration by *Forl*; E) Shothole induced by *Myrothecium roridum* on GF-677 (artificial inoculation).



Map 1 - Locations of new records of pathogenic species of *Protozoa, Chromista* and *Fungi* in the Maltese Archipelago.

Attard	26	Qrendi	52	St. Julians	20
Balzan	24	Rabat	30	St. Paul tal-Qlejja	18
Bidnija	12	Rabat (Gozo)	1	Ta' Qali	27
Binġemma	13	Ramla (Gozo)	2	Ta' Xbiex	39
Birkirkara	22	Safi	53	Wardija	7
Birżebbuġa	59	San Ġwann	21	Wied Ħas-Sabtan	54
Blata l-Bajda	43	San Martin (St. Paul's)	8	Wied id-Dies (Madliena)	15
Burmarrad	11	Sant Anton	25	Wied Inċita	31
Buskett	35	Santa Luċija	49	Wied tal-Isqof	33
Chadwick Lakes	19	Santa Venera	41	Wied tal-Mistra	5
Comino	3	Siġġiewi	36	Żabbar	48
Dingli	34	Sliema	38	Żebbiegħ	9
Fawwara	37	St. Paul's Bay	6	Żebbuġ	32
Għammieri	47	St. Thomas Bay	58	Żejtun	57
Għaxaq	56				
Gudja	55				
Ħal-Farruġ	51				
Lija	23				
Luqa	50				
Luqa (SVDP nursery)	46				
Magħtab	14				
Marsa	44				
Mdina	29				
Mellieħa	4				
Mġarr	10				
Mosta	17				
Msida	40				
Mtarfa	28				
Naxxar	16				
Pieta'	42				
Qormi	45				

During the two surveys aimed at detecting *P. ramorum*, this pathogen was never found. Other pathogenic species detected on plant material suspected to harbour *P. ramorum* are included in Table 3.

Among the most damaging diseases which we frequently observed during 2004-2006, we mention: Verticillium wilt of olive, powdery mildew (*Sphaerotheca pannosa* var. *persicae* on peaches and nectarines, *Leveillula taurica* on solanaceous crops and globe artichoke, *Oidium* spp. on fruit and vegetables), stem-rot (*Sclerotinia sclerotiorum*) on several vegetable crops, late blight of potato and stem blight of tomato (*Phytophtora infestans*), black scurf (*Thanatephorus cucumeris*) of potato, crown and root rot of tomato (*Fusarium oxysporum* f. sp. *radicis-lycopersici*), downy mildew of marrow and melon (*Pseudoperonospora cubensis*) and of lettuce (*Bremia lactucae*).

Another major problem is root-rot of fruit trees in which *Rosellinia necatrix* certainly plays an important role, although the aetiology of the disease is worthy further investigation. Grey mould (*Botrytis cinerea*) prevalence and incidence was high on several crops, mostly in greenhouses, and damages on tomato leaves, stems and fruits were often economically very important. Severe leaf mould (*Mycovellosiella fulva*) attacks on tomato were sometimes observed in greenhouses.

Brown root-rot (*Thielaviopsis basicola*) was often observed on GF-677 rootstock (*Prunus amygdalus* × *Prunus persica*). This disease heavily affected rootstock production in greenhouse beds and in open-field nursery and proved difficult to be controlled. Plantlets and nursery rootstock ready for commercialisation died or were frequently discarded because of the disease.

Beside the organisms listed in the tables, other fungi, mostly considered as saprophytes, were frequently observed on the examined plant material. Namely: species of *Acremonium*, *Alternaria*, *Aspergillus*, *Cladosporium*, *Doratomyces*, *Phialophora*, *Gliocladium*, *Memnoniella*, *Paecilomyces*, *Penicillium*, *Rhizopus*, *Stachybotrys chartarum* (Ehrenb.) S. Hughes, *Trichothecium roseum* (Pers.) Link, *Trichoderma harzianum* Rifai, *Trichoderma viride* Pers., species of *Ulocladium*.

Symptoms of corky root of tomato were observed on samples from Rabat (2004) and Żebbuġ (2005) but attempts to isolate *Pyrenochaeta lycopersici* failed.

Two-hundred thirty three species in total are listed in the tables, one belonging to *Protozoa*, 21 to *Chromista* and 211 to *Fungi*. More than 30 are new species reports.

Concluding remarks

Most of the species reported in the Saccardo's and the Wheeler's papers and in the Brook's reports are still present, sometimes they were found in the very location where they had been mentioned previously.

Several species, including important pathogens like *Spongospora subterranea* f. sp. *subterranea*, *Colletotrichum acutatum*, *Fusarium oxysporum* f. sp. *radicis-lycopersici*, seems to be of recent introduction.

The intensified trade, which is further developing due to the general world trend and to the accession of Malta into the EU, involves the introduction of living plant material used in agriculture (seeds, nursery stocks, etc.) so increasing the risk of introducing new pathogenic species or their variants. This stresses the need for further consolidating the quarantine service and the surveying activities in the Archipelago.

Particular care should be devoted to local plant material production. Black rot problems mentioned above on GF-677 could be controlled using healthy plant material, by sanitation of structures and materials used to produce plant and by soil treatments with fungicides when needed. Alternative control measures (biological control by antagonist bacteria or fungi, mycorrhizal species, etc.) should be investigated under local conditions.

Species of *Pleospora,* whose anamorphs *Alternaria* and *Stemphylium* apparently show large variability in Malta are present on many hosts. Saccardo (1915) had already mentioned the abundance of *Pleospora herbarum* in the Maltese Islands and suggested further studies to ascertain whether some forms deserved specific rank. The same author (*l. c.*) commented that Malta was apparently rich of forms of *Sphaeropsidales* unmatched by the corresponding ascigerous teleomorphs and gave the example of *Phomopsis-Diaporthe*. Our observations seem to confirm his opinion, and we believe that this comment may be extended to the abundant anamorphs related to *Botryosphaeria*.

Some of the species mentioned above are worthy further study to the species level and deeper research about their pathogenicity and virulence. According to our observations, also the genus *Colletotrichum* appears rich of species and of great pathogenic interest and should be further studied.

Another major issue which we wish to comment on refers to plant protection products. New active substances are being imported so that a broad spectrum

of chemicals is presently available to growers. To assure that this advantage is not converted into a threat to the health of the consumers (and the growers themselves) and to the environment, the necessary technical support is provided to growers on frequency, doses and the timing to apply products and for which crops and use they are registered. Moreover, monthly samples are taken from the *Pitkalija* Vegetable Market for residue analysis. The National Statistics Office of Malta has recently published a comprehensive survey (NSO, 2005) of plant protection product use on crops commercially grown in Malta and Gozo. Twenty crops were included in the survey, and it was concluded that relatively large areas of some crops remain untreated with any plant protection products and over half the total area grown of broad beans, lettuce, olives and wheat received no treatment. Other crops such as grapes, nectarines, potatoes, strawberries, tomatoes, marrows and watermelons were more frequently treated. Control of disease was the most frequent reason for plant protection products use, with fungicides dominating usage by both weight of plant protection products applied and area treated, the most used products being those based on dithiocarbamates, the phenyl amides, and sulphur. Herbicide usage was classified as infrequent in crop production. Its usage was important mostly in wheat and onions, where 43% and 26% respectively of the area was treated, and on average a single application being applied. Insecticide application was another important aspect of crop protection, often with a number of crops receiving two applications. Other plant protection products were insignificant in terms of volume of application, with the exception of acaricide use on strawberries. The NSO survey has revealed that, in general, plant protection products usage in Malta was low in comparison to other southern European countries. The use of plant protection products in Malta will most likely decrease in the near future. A relatively good number of growers are nowadays registering their fields as organic, and much information is available to growers on integrated pest management, minimizing the use of plant protection chemicals and integrating other means and measures (e.g. biological control agents) to prevent and to control plant pests and diseases.

The incidence and severity of several diseases, mostly of fruit trees and vegetables, had frequently been traced back to a lack of adequate cultural practices. We have often observed damages caused by soil-borne pathogens either due to planting trees too deep into the soil, or to excessive moisture at the trunk bases, consequent to inappropriate irrigation (drip irrigation devices being placed too close to main stem). Other constraints derive from the use of seed or plant material of poor quality. MRAE-

related institutions and private organisations have a key role to play in improving this situation. All those involved in providing technical support to the growers should increase their effort in order to disseminate the knowledge of the importance of agricultural practices in preventing plant diseases. The general level of education in Malta and the access of most people to mass media and the electronic communication systems suggest that this effort, deployed adequately to the local need and continuously, will be successful.

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Appendix I

List of pathogens by host

***Agaricus bisporus* (J. E. Lange) Pilát**
Hypomyces rosellus (Alb. & Schwein) Tul.
Mycogone sp.
Verticillium fungicola (Preuss) Hassebr.

***Allium cepa* L.**
Alternaria porri (Ellis) Cif.
Aspergillus niger v. Tiegh.
F. oxysporum f. sp. *cepae* W. C. Snyder & H. N. Hansen
Peronospora destructor (Berk.) Casp. ex Berk.
Pleospora herbarum (Pers.) Rabenh.
Pleospora sp.
Puccinia allii Rud.
Pythium sp.
Stemphylium vesicarium (Wallr.) E. G. Simmons
Thanatephorus cucumeris (A. B. Frank) Donk

***Allium sativum* L.**
Puccinia allii Rud.

***Allium* sp.**
Puccinia allii (DC.) F. Rudolphi

***Amygdalus communis* L.**
Cercospora rubro-tincta Ellis & Everh.
Cladosporium sp.
Pythium aphanidermatum (Edson) Fitzp.
Pythium aphanidermatum (Edson) Fitzp.
Rosellinia necatrix Berl. ex Prill.
Sclerotinia sclerotiorum (Lib.) de Bary
Taphrina deformans (Berk.) Tul.
Tranzschelia pruni-spinosae var. *discolor* (Fuckel) Dunegan

***Antirrhinum majus* L.**
Puccinia antirrhini Dietel & Holw.
Septoria antirrhini Desm.

***Apium graveolens* L. var. *dulce* (Miller) Pers.**
Cercospora apii Fresen
Septoria apiicola Speg.

***Araucaria* sp.**
Phytophthora sp.
Pythium echinulatum V.D. Matthews
Pythium sp.
Thanatephorus cucumeris (A. B. Frank) Donk

***Arbutus unedo* L.**
Pestalotiopsis maculans (Corda) Nag Raj
***Arisarum vulgare* Targ. Toz.**
Colletotrichum sp.
***Avena sterilis* L.**
Erysiphe sp.
Puccinia coronata Corda.
***Beta vulgaris* L.**
Cercospora beticola Sacc.
***Brassica oleracea* L. var. *botrytis* L.**
Fusarium sp.
Mycosphaerella brassicicola (Duby) Lindau.
Pythium sp.
Thanatephorus cucumeris (A. B. Frank) Donk
***Brassica oleracea* L. var. *capitata* L.**
Alternaria tenuissima (Nees ex Fr.) Wiltsh.
Leptoshaeria maculans (Desm.) Ces. & de Not.
Mycosphaerella brassicicola (Duby) Lindau.
Peronospora parasitica (Pers.) Fr.
***Brassica oleracea* L. var. *gongylodes* L.**
Alternaria brassicicola (Schwein.) Wiltshire
Mycosphaerella brassicicola (Duby) Lindau.
Peronospora parasitica (Pers.) Fr.
***Brassica rapa* ssp. *silvestris* (L.) Lam. & Janch.**
Albugo candida (Pers.) Kuntze
***Calendula officinalis* L.**
Entyloma calendulae (Oudem.) de Bary
Oidium sp.
Sphaerotheca humuli (DC.) Burr.
***Capsella bursa-pastoris* (L.) Medik.**
Albugo candida (Pers.) Kuntze
Peronospora parasitica (Pers.) Fr.
***Capsicum annuum* L.**
Botrytis cinerea Pers.
Leveillula taurica (Lév.) G. Arnaud.
Phytophthora capsici Leonian
Phytophthora nicotianae Breda de Hann
Phytophthora sp.
Sclerotinia sclerotiorum (Lib.) de Bary
Thanatephorus cucumeris (A. B. Frank) Donk
***Carthamus tinctorius* L.**
Puccinia carthami Corda.

***Carya illinoiensis* (Wagenh.) K. Koch**
Ganoderma lucidum (Curtis) P. Karst.
***Ceratonia siliqua* L.**
Cercospora sp.
Coriolopsis aspera (Jungh)Teng.
Inonotus indicus (Mass.) Pieri & Rivoire
Laetiporus sulfureus (Bull.) Murill
Pseudocercospora ceratoniae (Pat. & Taubenh.) Deighton
***Chamaerops humilis* L.**
Graphiola phoenicis (Moug.) Poit.
***Chenopodium murale* L.**
Peronospora farinosa (Fr.) Fr. f. sp. *spinaciae* Byford.
Chrysanthemum × morifolium
Cladosporium sp.
Puccinia horiana Henn.
Pythium sp.
Thanatephorus cucumeris (A. B. Frank) Donk
***Cicer arietinum* L.**
Uromyces ciceris-arietini (Grognot) Jacz. & Boid.
***Cichorium endivia* L.**
Pleospora herbarum (Pers.) Rabenh.
Puccinia hieracii var. *hieracii* (Röhl.) H. Mart.
***Cichorium spinosum* L.**
Leptoshaeria modesta (Desm.) P. Karst.
Puccinia hieraci var. *hieraci* Röhl.
***Citrullus lanatus* (Thumb.) Matsumura & Nakai**
F. oxysporum f. sp. *niveum* W. C. Snyder & H. N. Hansen
***Citrus limon* Burm.**
Alternaria citri Ellis & N. Pierce
Botryosphaeria rhodina (Berk. & M. A. Curtis) Arx.
Penicillium citrinum Thom.
Penicillium digitatum (Pers.) Sacc.
Penicilium italicum Wehmer
Pleospora herbarum (Pers.) Rabenh.
***Citrus sinensis* Osbeck**
Botryosphaeria rhodina (Berk. & M. A. Curtis) Arx.
Colletotrichum sp.
Coniothecium sp.
Diaporthe citri F.A. Wolf
Glomerella cingulata (Stoneman) Spauld. & H. Schrenk
Nectria heterosperma Kalchbr. & Cooke
Penicilium italicum Wehmer
Penicillium digitatum (Pers.) Sacc.

***Citrus* spp.**

Armillaria mellea (Vahl) P. Kumm.
Botryosphaeria sp.
Cladosporium sp.
Nectria episphaeria (Tode) Fr.
Penicilium italicum Wehmer
Penicillium digitatum (Pers.) Sacc.
Phytophthora citricola Sawada
Phytophthora nicotianae Breda de Hann
Phytophthora sp.
Pythium sp.
Stemphylium vesicarium (Wallr.) E. G. Simmons
Thanatephorus cucumeris (A. B. Frank) Donk

***Clematis cirrhosa* L.**

Aecidium clematidis DC.

***Convolvolus arvensis* L.**

Oidium sp.
Septoria convolvuli Desm.

***Cucumis melo* L.**

Botrytis cinerea Pers.
F. oxysporum f. sp. *melonis* W. C. Snyder & H. N. Hansen
Lasiodiplodia theobromae (Pat.) Griffon & Maubl.
Pestalotiopsis maculans (Corda) Nag Raj
Pseudoperonospora cubensis (Berk. & Curtis) Rostov.
Pythium echinulatum V. D. Matthews
Rhizopus sp.
Sclerotinia sclerotiorum (Lib.) de Bary
Verticillium dahliae Kleb.

***Cucumis sativus* L.**

Botrytis cinerea Pers.
Cladosporium cucumerinum Ellis & Arthur
Pseudoperonospora cubensis (Berk. & Curtis) Rostov.
Sphaerotheca fuliginea (Schltdl.) Pollaci
Stemphylium sp.

***Cucurbita pepo* L.**

Botrytis cinerea Pers.
Gibberella intricans Wollenw.
Oidium sp.
Pseudoperonospora cubensis (Berk. & Curtis) Rostov.
Rhizopus sp.

Cupressus sempervirens

Sphaeropsis sp.

***Cynara scolymus* L.**
Aspergillus ochraceus Wilhelm
Leveillula taurica (Lév.) G. Arnaud.
***Daucus carota* L. ssp. *sativus* (Hoffm.) Arcang.**
Alternaria dauci (Kühn) J. W. Groves & Skolko
Erysiphe heraclei DC.
***Dianthus caryophyllus* L.**
Alternaria dianthi F. Stevens & J. G. Hall
Fusarium oxysporum f. sp. *dianthi* W. C. Snyder & H. N. Hansen
Fusarium sp.
Thanatephorus cucumeris (A. B. Frank) Donk
Uromyces dianthi (Pers.) Niessl.
***Diplotaxis erucoides* (L.) DC.**
Albugo candida (Pers.) Kuntze
Peronospora parasitica (Pers.) Fr.
***Diplotaxis tenuifolia* (L.) DC.**
Albugo candida (Pers.) Kuntze
Peronospora parasitica (Pers.) Fr.
***Dittrichia viscosa* (L.) W. Greuter**
Coleosporium inulae Rabenh.
***Eriobotrya japonica* (Thunb.) Lindl.**
Diplodia sp.
Lasiodiplodia theobromae (Pat.) Griffon & Maubl.
Spilocaea pyracanthae (G. H. Otth) Arx
***Erodium* sp. [*E. moscatum* (?) (L.) L'Hér.]**
Oidium sp.
***Euonymus japonicus* Thunb.**
Microsphaera euonymi-japonici Vienn.-Bourg.
Pleospora sp.
***Euphorbia helioscopia* L.**
Melampsora euphorbiae (Schub.)
***Euphorbia peplus* L.**
Melampsora euphorbiae-gerardianae W. Muell.
***Ficus carica* L.**
Botrytis cinerea Pers.
***Fragaria* × *ananassa* Duch.**
Botrytis cinerea Pers.
Colletotrichum acutatum J. H. Simmonds
Colletotrichum fragariae A. N. Brooks
Fusarium oxysporum Schltdl.
Mycosphaerella fragariae (Tul.) Lindau
Nectria haematococca Berk. & Broome
Pestalotiopsis funerea (Desm.) Steyaert

Phytophthora nicotianae Breda de Hann
Phytophthora sp.
Pythium echinulatum V. D. Matthews
Pythium sp.
Rhizopus sp.
Sphaerotheca humuli (DC.) Burr.
Thanatephorus cucumeris (A. B. Frank) Donk
Verticillium dahliae Kleb.

***Fraxinus oxycarpae* Bieb.**
Eutypella scoparia (Schwein.) Ellis & Everh.

***Galactites tomentosa* Moench.**
Puccinia galactitis P. Syd. & Syd.

***Gazania* Gaertn. hybrid**
Leveillula taurica (Lév.) G. Arnaud.

***Gerbera jamesonii* Bolus ex Hook.**
Botrytis cinerea Pers.
Phytophthora cryptogea Pethybr. & Lafferty.

Gladiolus × hortolanus
Uromyces transversalis (Thüm.) G. Winter

***Gladiolus italicus* P. Mill**
Puccinia gladioli Castagne

***Haworthia* sp.**
Thielaviopsis basicola (Berk. & Broome) Ferraris

***Hedera helix* L.**
Coniothyrium sp.
Phoma hedericola (Durieu & Mont.) Boerema
Phyllosticta sp.

***Hedisarum coronarium* L.**
Cercospora ariminensis Cavara
Erysiphe sp.
Phyllachora sp.
Pleospora sp.

***Helianthus annuus* L.**
Erysiphe cichoracearum f. *helianthi* Jacz.
Puccinia helianthi Schwein

***Hordeum murinum* spp. *leporinum* (Link) Arcang.**
Puccinia hordei G. H. Otth.
Pyrenophora teres Drechsler

***Hordeum vulgare* L.**
Oidium sp.
Puccinia graminis Pers. subsp. *graminis* f. sp. *tritici* Erikss. & Henning
Puccinia hordei G. H. Otth.
Pyrenophora graminea S. Ito & Kurib.

Rhynchosporium secalis (Oudem) Davis
Ustilago hordei (Pers.) Lagerh.
Ustilago nuda f. sp. *hordei* Shaffnit.

***Lactuca sativa* L.**
Bremia lactucae Regel.
Pleospora herbarum (Pers.) Rabenh.

***Lamium amplexicaule* L.**
Oidium sp.

***Lathyrus ochrus* (L.) DC.**
Cercospora canescens Ell. & Mart.

***Laurus nobilis* L.**
Glomerella cingulata (Stoneman) Spauld. & H. Schrenk
Myrothecium roridum Tode.

***Limonium bonduelli* Lestib.**
Uromyces savulescui Rayss.

***Limonium brassicifolium* (Webb.) O. Kuntze**
Cercospora insulana Sacc.

***Limonium sinuatum* (L.) P. Mill.**
Uromyces savulescui Rayss.

***Lonicera implexa* Aiton**
Pheoramularia peryclimeni (G. Winter) Deighton
Pleospora sp.

***Lotus ornithopodioides* L.**
Oidium sp.

***Lygeum spartum* Loefl. ex L.**
Ustilago spegazzini Hirschh. var. *agrestis* (Syd.) G.W. Fisch. & Hirschh.

***Malus domestica* Borkh.**
Cladosporium sp.
Oidium sp.
Rosellinia necatrix Berl. ex Prill.
Thanatephorus cucumeris (A. B. Frank) Donk
Venturia inaequalis (Cooke) G. Winter

***Malva silvestris* L.**
Puccinia malvacearum Bertero ex Mont.

***Matthiola incana* (L.) R. Br.**
Peronospora matthiolae Gäum.

***Matthiola* sp.**
Ascochyta matthiolae Oudem.
Peronospora parasitica (Pers.) Fr.

***Medicago sativa* L.**
Pseudopeziza medicaginis (Lib.) Sacc.
Uromyces striatus J. Schröt.

***Melilotus indicus* (L.) All.**
Peronospora trifoliorum de Bary
Uromyces anthyllidis (Grev.) J. Schröt
***Mentha* sp.**
Puccinia menthae Pers.
Ramularia menthicola Sacc.
Thanatephorus cucumeris (A. B. Frank) Donk
***Mercurialis annua* L.**
Cercospora mercurialis Pass.
Melampsora pulcherrima Maire.
***Morus alba* L.**
Mycosphaerella mori (Fuckel) F. A. Wolf.
***Morus nigra* L.**
Mycosphaerella mori (Fuckel) F. A. Wolf.
***Nerium oleander* L.**
Cercospora neriella Sacc.
Cladosporium sp.
Pleospora herbarum (Pers.) Rabenh.
***Ocimum basilicum* L.**
Peronospora sp.
***Olea europaea* L.**
Caldariomyces fumago Woron.
Cylindrocarpon sp.
Fusarium oxysporum Schltdl.
Macrophomina phaseolina (Tassi) Goid.
Nectria haematococca Berk. & Broome
Spilocaea oleaginea (Castagne) S. Hughes
Thanatephorus cucumeris (A. B. Frank) Donk
Verticillium dahliae Kleb.
***Oxalis pes-caprae* L.**
Botrytis cinerea Pers.
***Parietaria judaica* L.**
Ramularia parietariae Pass.
***Passiflora edulis* Sims**
Phoma tersa Sacc.
***Pastinaca sativa* L.**
Septoria pastinacae Westend
***Pelargonium* sp.**
Puccinia pelargonii-zonalis Doidge
***Petroselinum crispum* (P. Mill) Nyman ex A.W. Hill**
Erysiphe heraclei DC.
Passalora depressa (Berk.) Sacc.
Septoria petroselini Desm.

***Phalaris minor* Rez.**
Erysiphe sp.
***Phaseolus vulgaris* L.**
Sclerotinia sclerotiorum (Lib.) de Bary
***Phoenix canariensis* hort. ex Chabaud**
Colletotrichum sp.
***Pinus halepensis* P. Mill.**
Botryosphaeria dothidea (Moug.) Ces. & de Not.
Thanatephorus cucumeris (A. B. Frank) Donk
***Pisum sativum* L.**
Cladosporium cladosporioides f. sp. *pisicola* (Snyder) G. A. de Vries
Erisiphe pisi DC.
Erysiphe sp.
Mycosphaerella pinodes (Berk. & A. Bloxam) Vestergr.
Peronospora viciae (Berk.) Casp.
Uromyces pisi-sativi (Pers) Liro
Uromyces viciae-fabae (Pers.) J. Schröt.
***Plantago maritima* L.**
Septoria plantaginea Pass.
***Polygonum aviculare* L.**
Uromyces polygoni-avicularis (Pers.) P. Karst.
***Populus alba* L.**
Cladosporium sp.
Melampsora populnea (Pers.) P. Karst.
Microdiplodia salicis Died.
Otthia spireae (Fuckel) Fuckel
***Portulaca oleracea* L.**
Wilsoniana portulacae (DC. ex Duby) Thines
***Potentilla reptans* L.**
Ramularia arvensis Sacc.
Prunus amygdalus* × *Prunus persica
Fusarium sp.
Fusicoccum amygdali Delacr.
Myrothecium roridum Tode.
Nectria haematococca Berk. & Broome
Thielaviopsis basicola (Berk. & Broome) Ferraris
Tranzschelia pruni-spinosae var. *discolor* (Fuckel) Dunegan
Venturia carpophila E. E. Fisher
***Prunus armeniaca* L.**
Alternaria alternata (Fr.) Keissler
Oidium sp.
Rosellinia necatrix Berl. ex Prill.
Tranzschelia pruni-spinosae var. *discolor* (Fuckel) Dunegan

***Prunus cerasifera* Ehrh.**

Thielaviopsis basicola (Berk. & Broome) Ferraris
Tranzschelia pruni-spinosae var. *discolor* (Fuckel) Dunegan

***Prunus domestica* L.**

Botryosphaeria sp.
Rosellinia necatrix Berl. ex Prill.
Thielaviopsis basicola (Berk. & Broome) Ferraris
Tranzschelia pruni-spinosae var. *discolor* (Fuckel) Dunegan

***Prunus persica* (L.) Batsch.**

Botryosphaeria stevensii Shoemaker
Fusicoccum amigdali Delacr.
Ganoderma sp.
Geotrichum candidum Link var. *candidum*
Microdiplodia pruni Died.
Monilinia fructigena Honey
Phellinus pomaceus (Pers.) Maire
Phytophthora nicotianae Breda de Hann
Phytophthora sp.
Pythium echinulatum V. D. Matthews
Pythium sp.
Rhizopus stolonifer (Ehrenb. Ex Fr.) Lind.
Rosellinia necatrix Berl. ex Prill.
Sphaerotheca pannosa var. *persicae* Woron.
Taphrina deformans (Berk.) Tul.
Thanatephorus cucumeris (A. B. Frank) Donk
Tranzschelia pruni-spinosae var. *discolor* (Fuckel) Dunegan

***Punica granatum* L.**

Cytospora punica Sacc.

***Pyrus communis* L.**

Alternaria tenuissima (Nees ex Fr.) Wiltsh.
Cladosporium sp.
Lasiodiplodia theobromae (Pat.) Griffon & Maubl.
Rosellinia necatrix Berl. ex Prill.
Septoria piri I. Miyake
Venturia pyrina Aderh.

***Quercus coccifera* L.**

Pseudovalsa longipes (Tul.) Sacc.

***Quercus ilex* L.**

Ganoderma lucidum (Curtis) P. Karst.
Lasiodiplodia theobromae (Pat.) Griffon & Maubl.

***Quercus robur* L.**

Diatrypella quercina (Pers.) Cooke
Oidium sp.

***Rhododendron* sp.**
Botrytis cinerea Pers.
Calonectria kyotensis Terash
Chlamydomyces palmarum (Cooke) E. W. Mason
***Rosa* sp.**
Botrytis cinerea Pers.
Oidium sp.
Phragmidium mucronatum (Pers.) Schltd.
Sphaerotheca pannosa Wallr. Lév.
***Rostraria cristata* (L.) Tzvelev**
Puccinia hordei G. H. Otth.
Rubus ulmifolius
Phragmidium violaceum (Schultz) G. Winter
***Ruscus aculeatus* L.**
Paraphaeosphaeria glaucopunctata (Grev.) Shoemaker & C. E. Babc.
***Ruscus hypophyllum* L.**
Paraphaeosphaeria glaucopunctata (Grev.) Shoemaker & C. E. Babc.
Phyllosticta sp.
***Sanguisorba minor* Scop. ssp. *muricata* (Spach) Nordborg**
Phragmidium sanguisorbae (DC.) J. Schröt.
***Scirpus maritimus* L.**
Uromyces lineolatus (Desm.) J. Schröt.
Scorpiurus muricatus
Cercospora scorpiuri Thüm.
***Sechium edule* (Jacq.) Sw.**
Pythium sp.
***Senecio vulgaris* L.**
Bremia lactucae Regel.
Puccinia glomerata Grev.
***Smilax aspera* L.**
Cercospora smilacis Thüm.
***Smyrnium olusatrum* L.**
Oidium sp.
Puccinia smyrni Biv.
***Solanum lycopersicum* L.**
Alternaria tenuissima (Nees ex Fr.) Wiltsh.
Alternaria solani Sorauer
Botrytis cinerea Pers.
Cladosporium sp.
Erysiphe sp.
F. oxysporum f. sp. *lycopersici* W. C. Snyder & H. N. Hansen
F. oxysporum f. sp. *radicis-lycopersici* Jarvis & Shoemaker
Gibberella intricans Wollenw.

Leveillula taurica (Lév.) G. Arnaud.
Mycovellosiella fulva (Cooke) Arx
Nectria haematococca Berk. & Broome
Phytophthora infestans (Mont.) de Bary.
Phytophthora nicotianae Breda de Hann
Pythium sp.
Sclerotinia sclerotiorum (Lib.) de Bary
Stemphylium sp.
Thanatephorus cucumeris (A. B. Frank) Donk
Verticillium dahliae Kleb.

***Solanum melongena* L.**

Botrytis cinerea Pers.
Leveillula taurica (Lév.) G. Arnaud.
Phytophthora nicotianae Breda de Hann
Sclerotinia sclerotiorum (Lib.) de Bary
Thanatephorus cucumeris (A. B. Frank) Donk
Verticillium dahliae Kleb.

***Solanum tuberosum* L.**

Colletotrichum coccodes (Wallr.) S. Hughes
Helminthosporium solani Durieu & Mont.
Nectria haematococca Berk. & Broome
Phytophthora infestans (Mont.) de Bary
Pleospora herbarum (Pers.) Rabenh.
Spongospora subterranea (Wallr.) Lagerheim f. sp. *subterranea* Tomlinson
Thanatephorus cucumeris (A. B. Frank) Donk
Verticillium dahliae Kleb.

***Sonchus oleraceus* L.**

Alternaria sonchi Davis
Bremia lactucae Regel.
Puccinia sonchi Roh.

***Spinacia oleracea* L.**

Peronospora farinosa (Fr.) Fr. f. sp. *spinaciae* Byford.

***Tamarix africana* Poir.**

Inonotus tamaricis (Pat.) Maire

***Tetraclinis articulata* (Vahl) Masters**

Botryosphaeria dothidea (Moug.) Ces. & de Not.

***Trifolium fragiferum* L.**

Oidium sp.
Uromyces trifolii-repentis (Castagne) Liro

***Triticum aestivum* L.**

Blumeria graminis (DC.) Speer

***Triticum durum* Desf.**

Blumeria graminis (DC.) Speer
Cladosporium sp.
Fusarium sp.
Puccinia graminis Pers. subsp. *graminis* f. sp. *tritici* Erikss. & Henning
Puccinia striiformis Westend. var. *striiformis*

***Triticum* sp.**

Puccinia graminis Pers. subsp. *graminis* f. sp. *tritici* Erikss. & Henning

***Urtica pilulifera* (?) L.**

Septoria urticae Roberge ex Desm.

***Viburnum tinus* L.**

Pythium sp.
Sphaceloma viburni Jenkins & Bitanc

***Vicia ervilia* (L.)**

Oidium sp.

***Vicia faba* L.**

Botrytis fabae Sardiña
Cercospora zonata G. Winter
Nectria haematococca Berk. & Broome
Sclerotinia sclerotiorum (Lib.) de Bary
Sclerotinia sp.
Uromyces viciae-fabae (Pers.) J. Schröt.

***Vicia sativa* L.**

Cercospora zonata G. Winter
Uromyces viciae-fabae (Pers.) J. Schröt.

***Vitis vinifera* L.**

Aspergillus niger v. Tiegh.
Cylindrocarpon sp.
Didymosphaeria sarmenti (Cooke & Harkn.) Berl. & Voglino
Macrophoma sp.
Phomopsis viticola (Sacc.) Sacc.
Plasmopara viticola (Berk. & M. A. Curtis) Berl. & de Toni.
Pleospora vitis Catt.
Pseudocercospora vitis (Lév.) Speg.
Pythium echinulatum V. D. Matthews
Pythium sp.
Thanatephorus cucumeris (A. B. Frank) Donk
Thielaviopsis basicola (Berk. & Broome) Ferraris
Uncinula necator (Schwein.) Burrill
Verticillium dahliae Kleb.

***Washingtonia robusta* H. Wendl.**

Gliocladium vermoesenii (Biourge) Thom.
Graphiola phoenicis (Moug.) Poit.

Appendix II

List of diseases by common name (where available) and corresponding pathogen(s) causing the disease

Alternaria leaf blight
Alternaria dauci (Kühn) J. W. Groves & Skolko
Basal rot
Fusarium oxysporum f. sp. *cepae* W. C. Snyder & H. N. Hansen
Black dot
Colletotrichum coccodes (Wallr.) S. Hughes
Blackleg
Leptoshaeria maculans (Desm.) Ces. & de Not.
Black mould
Aspergillus niger v. Tiegh.
Black rot
Aspergillus niger v. Tiegh.
Black scurf
Thanatephorus cucumeris (A. B. Frank) Donk
Blackspot
Colletotrichum acutatum J. H. Simmonds
Black stem rust
Puccinia graminis Pers. subsp. *graminis* f. sp. *tritici* Erikss. & Henning
Blight
Mycosphaerella pinodes (Berk. & A. Bloxam) Vestergr.
Branch and twig canker
Fusicoccum amygdali Delacr.
Brown root-rot
Thielaviopsis basicola (Berk. & Broome) Ferraris
Canker
Nectria heterosperma Kalchbr. & Cooke
Charcoal rot
Macrophomina phaseolina (Tassi) Goid.
Chocolate spot
Botrytis fabae Sardiña
Covered smut
Ustilago hordei (Pers.) Lagerh.
Crown and root rot
Fusarium oxysporum f. sp. *radicis-lycopersici* Jarvis & Shoemaker
Die-back
Alternaria citri Ellis & N. Pierce
Botryosphaeria rhodina (Berk. & M. A. Curtis) Arx

Cytospora punica Sacc.
Microdiplodia pruni Died.

Downy mildew

Bremia lactucae Regel.
Peronospora destructor (Berk.) Casp. ex Berk.
Peronospora farinosa (Fr.) Fr. f. sp. *spinaciae* Byford.
Peronospora matthiolae Gäum.
Peronospora parasitica (Pers.) Fr.
Peronospora trifoliorum de Bary
Peronospora viciae (Berk.) Casp.
Peronospora sp.
Plasmopara viticola (Berk. & M. A. Curtis) Berl. & de Toni
Pseudoperonospora cubensis (Berk. & Curtis) Rostov.

Ear blotch

Cladosporium sp.

Early blight

Alternaria solani Sorauer
Cercospora apii Fresen

Fruit-rot

Alternaria citri Ellis & N. Pierce
Alternaria tenuissima (Nees ex Fr.) Wiltsh.
Penicillium citrinum Thom.
Penicillium digitatum (Pers.) Sacc.
Penicilium italicum Wehmer
Pleospora herbarum (Pers.) Rabenh.
Rhizopus stolonifer (Ehrenb. ex Fr.) Lind.

Grey mould

Botrytis cinerea Pers.

Late blight

Phytophthora infestans (Mont.) de Bary
Septoria apiicola Speg.

Leaf black spot

Alternaria brassicicola (Schwein.) Wiltshire

Leaf blight

Diplodia sp.
Pleospora sp.

Leaf blight and shot hole

Myrothecium roridum Tode

Leaf blotch

Calonectria kyotensis Terash.

Leaf curl

Taphrina deformans (Berk.) Tul.

Leaf mould

Mycovellosiella fulva (Cooke) Arx

Leaf scab

Graphiola phoenicis (Moug.) Poit.

Leaf spot

Alternaria dianthi (?) F. Stevens & J. G. Hall
Alternaria sonchi Davis
Ascochyta matthiolae Oudem.
Cercospora ariminensis Cavara
Cercospora beticola Sacc.
Cercospora canescens Ellis & G. Martin
Cercospora insulana Sacc.
Cercospora mercurialis Pass.
Cercospora neriella Sacc.
Cercospora rubro-tincta Ellis & Everh.
Cercospora smilacis Thüm.
Mycosphaerella fragariae (Tul.) Lindau
Mycosphaerella mori (Fuckel) F. A. Wolf
Passalora depressa (Berk.) Sacc.
Phoma hedericola (Durieu & Mont.) Boerema
Pleospora herbarum (Pers.) Rabenh.
Pleospora vitis Catt.
Pleospora sp.
Pseudocercospora ceratoniae (Pat. & Taubenh.) Deighton
Pseudopeziza medicaginis (Lib.) Sacc.
Ramularia arvensis Sacc.
Septoria antirrhini Desm.
Septoria convolvuli Desm.
Septoria petroselini Desm.
Septoria pastinacae Westend
Septoria plantaginea Pass.
Septoria piri I. Miyake
Septoria urticae Roberge ex Desm.
Sphaceloma viburni Jenkins & Bitanc.

Leaf stripe

Pyrenophora graminea S. Ito & Kurib.

Loose smut

Ustilago nuda f. sp. *hordei* Shaffnit

Net blotch

Pyrenophora teres Drechsler

Peacock spot

Spilocaea oleaginea (Castagne) S. Hughes

Phytophthora crown and root rot
Phytophthora cryptogea Pethybr. & Laff.
(Potato) rot
Fusarium coeruleum (Sacc.) C. Booth
Powdery mildew
Blumeria graminis (DC.) Speer
Erysiphe cichoracearum f. *helianthi* Jacz.
Erysiphe heraclei DC.
Erysiphe sp.
Leveillula taurica (Lév.) G. Arnaud
Microsphaera euonymi-japonici Vienn.-Bourg.
Oidium sp.
Sphaerotheca fuliginea (Schltdl.) Pollaci
Sphaerotheca humuli (DC.) Burrill
Sphaerotheca pannosa Wallr. Lév.
Sphaerotheca pannosa var. *persicae* Woron.
Powdery scab
Spongospora subterranea (Wallr.) Lagerheim f. sp. *subterranea* Tomlinson
Ring spot
Mycosphaerella brassicicola (Duby) Lindau
Root-rot
Gibberella intricans Wollenw.
Rosellinia necatrix Berl. ex Prill.
Rust
Aecidium clematidis DC.
Coleosporium inulae Rabenh.
Melampsora euphorbiae (Schub.) Castagne
Melampsora euphorbiae-gerardianae W. Muell.
Melampsora populnea (Pers.) P. Karst.
Melampsora pulcherrima Maire.
Phragmidium mucronatum (Pers.) Schltd.
Phragmidium sanguisorbae (DC.) J. Schröt.
Phragmidium violaceum (Schultz) G. Winter
Puccinia allii (DC.) F. Rudolphi
Puccinia antirrhini Dietel & Holw.
Puccinia carthami Corda
Puccinia coronata Corda
Puccinia galactitis P. Syd. & Syd.
Puccinia gladioli Castagne
Puccinia glomerata Grev.
Puccinia helianthi Schwein
Puccinia hieracii var. *hieracii* (Röhl.) H. Mart.

Puccinia hordei G. H. Otth
Puccinia malvacearum Bertero ex Mont.
Puccinia menthae Pers.
Puccinia pelargonii-zonalis Doidge
Puccinia smirni Biv.
Puccinia sonchi Roh.
Tranzschelia pruni-spinosae var. *discolor* (Fuckel) Dunegan
Uromyces anthyllidis (Grev.) J. Schröt.
Uromyces ciceris-arietini (Grognot) Jacz. & Boid.
Uromyces dianthi (Pers.) Niessl.
Uromyces lineolatus (Desm.) J. Schröt.
Uromyces pisi-sativi (Pers) Liro
Uromyces polygoni-avicularis (Pers.) P. Karst.
Uromyces savulescui Rayss
Uromyces striatus J. Schröt.
Uromyces transversalis (Thüm.) G. Winter
Uromyces viciae-fabae (Pers.) J. Schröt.

Scab

Cladosporium cladosporioides f. sp. *pisicola* (Snyder) G. A. de Vries
Cladosporium cucumerinum Ellis & Arthur
Venturia inaequalis (Cooke) G. Winter
Venturia pyrina Aderh.

Scald

Rhynchosporium secalis (Oudem) Davis

Silver scurf

Helminthosporium solani Durieu & Mont.

Sooty mould

Caldariomyces fumago Woron.
Cladosporium sp.
Coniothecium sp.

Stem blight

Phytophthora infestans (Mont.) de Bary

Stem-rot

Sclerotinia sclerotiorum (Lib.) de Bary

Tar spot

Phyllachora sp.

White rust

Albugo candida (Pers.) Kuntze
Puccinia horiana Henn.

White smut

Entyloma calendulae (Oudem.) de Bary

Wilt

Fusarium oxysporum f. sp *dianthi* W. C. Snyder and H. N. Hansen
Fusarium oxysporum f. sp *lycopersici* W. C. Snyder and H. N. Hansen
Fusarium oxysporum f. sp *melonis* W. C. Snyder and H. N. Hansen
Fusarium oxysporum f. sp *niveum* W. C. Snyder and H. N. Hansen
Verticillium dahliae Kleb.

Wood decay

Phellinus pomaceus (Pers.) Maire

Yellow rust

Puccinia striiformis var. *striiformis* Westend.

Zonate leaf spot

Cercospora zonata G. Winter

Appendix III

List of hosts by common English name followed by scientific and Maltese names.

Aleppo pine	*Pinus halepensis*	Żnuber
Alexanders	*Smyrnium olusatrum*	Karfus il-ħmir
Almond	*Amygdalus communis*	Lewża
Annual mercury	*Mercurialis annua*	Burikba
Apple	*Malus domestica*	Tuffieħa
Apricot	*Prunus armeniaca*	Pruna
Arar tree	*Tetraclinis articulata*	Għargħar
Araucaria	*Araucaria* sp.	Arawkarja
Ash	*Fraxinus oxycarpa*	Fraxnu
Aubergine	*Solanum melongena*	Brunġiel
Azalea	*Rhododendron* sp.	Rododendron
Bargeman's cabbage	*Brassica rapa* ssp. *silvestris*	Liftija
Barley	*Hordeum vulgare*	Xgħir
Basil	*Ocimum basilicum*	Ħabaq
Bay-laurel	*Laurus nobilis*	Rand
Beetroot	*Beta vulgaris*	Pitravi
Bermuda buttercup	*Oxalis pes-caprae*	Ħaxixa Inġliża
Birdsfoot trefoil	*Lotus ornithopodioides*	Qrempuċ il-mogħoż
Bitter almond	*Amygdalus communis*	Lewż morr
Bitter vetch	*Vicia ervilia*	Żofżfa
Blackberry	*Rubus ulmifolius*	Għolliq
Black mulberry	*Morus nigra*	Tut
Boar thistle	*Galactites tomentosa*	Xewk abjad
Bread wheat	*Triticum aestivum*	Qamħ ta' Malta
Broad bean	*Vicia faba*	Ful
Butcher's broom	*Ruscus aculeatus*	Belladonna
Cabbage	*Brassica oleracea* var. *capitata*	Kaboċċa
Canary Island date palm	*Phoenix canariensis*	Palma
Carnation	*Dianthus caryophyllus*	Qronfol
Carob tree	*Ceratonia siliqua*	Ħarrub
Carrot	*Daucus carota* ssp. *sativus*	Karrotti
Caterpillar plant	*Scorpiurus muricatus*	Widna
Cauliflower	*Brassica oleracea* var. *botrytis*	Pastarda
Celery	*Apium graveolens* var. *dulce*	Karfus
Chayote	*Sechium edule*	Qargħa Ċentenarja
Cherry plum	*Prunus cerasifera*	'Cherry plum'
Chickpea	*Cicer arietinum*	Ċiċri

Chrysanthemum	*Chrysanthemum* × *morifolium*	Kriżantemi
Citrus	*Citrus* sp.	Ċitru
Club-rush	*Scirpus maritimus*	Mosca
Common groundsel	*Senecio vulgaris*	Kubrita
Common knot-grass	*Polygonum aviculare*	Lewża tar-raba’
Common vetch	*Vicia sativa*	Ġilbiena
Courgette	*Cucurbita pepo*	Qargħa bagħli
Creeping cinquefoil	*Potentilla reptans*	Frawli salvaġġa
Cucumber	*Cucumis sativus*	Ħjar
Cypress	*Cupressus sempervirens*	Ċipress
Durum wheat	*Triticum durum*	Qamħ
Dutch Butcher’s broom	*Ruscus hypophyllum*	Belladonna
Dwarf fan palm	*Chamaerops humilis*	Ġummar
Edible fig	*Ficus carica*	Tin
Endive	*Cichorium endivia*	Indivja
English ivy	*Hedera helix*	Liedna
English oak	*Quercus robur*	Balluta Ngliża
Esparto grass	*Lygeum spartum*	Ħalfa
Field bindweed	*Convolvolus arvensis*	Leblieb tar-raba’
Friar’s cowl	*Arisarum vulgare*	Garni tal-pipi
Garlic	*Allium sativum*	Tewm
Gazania	*Gazania* sp.	Gażanja
Gerbera daisy	*Gerbera jamesonii*	
GF-677 rootstock	*Prunus amygdalus* × *Prunus persica*	GF
Gladiolus	*Gladiolus* × *hortolanus*	Gladjoli
Globe artichoke	*Cynara scolymus*	Qaqoċċ
Grapevine	*Vitis vinifera*	Dielja
Haworthia	*Haworthia* sp.	
Henbit deadnettle	*Lamium amplexicaule*	Kappilliera
Mallow	*Malva silvestris*	Ħobbejża
Holly oak	*Quercus ilex*	Ballut
Honeysuckle	*Lonicera implexa*	Qarn il-mogħża
Italian gladiolus	*Gladiolus italicus*	Ħabb il-qamħ
Japanese spindletree	*Euonymus japonicus*	
Kohlrabi	*Brassica oleracea gongyloides*	Ġidra
Kermes oak	*Quercus coccifera*	Ballut
Laurustinus	*Viburnum tinus*	
Lemon	*Citrus limon*	Lumi
Lettuce	*Lactuca sativa*	Ħass
Littleseed canarygrass	*Phalaris minor*	Skalora salvaġġa
Loquat	*Eriobotrya japonica*	Naspli
Lucerne	*Medicago sativa*	Nefel
Marigold	*Calendula officinalis*	Suffejra

Marrow	*Cucurbita pepo*	Qarabagħli
Mallow	*Malva sylvestris*	Ħobbejża komuni
Melon	*Cucumis melo*	Bettiegħ
Mint	*Mentha* sp.	Nagħniegħ
Mushroom	*Agaricus bisporus*	Faqqiegħ
Musk stork's bill	*Erodium moschatum*	Moxt
Myrobalan rootstock 29C	*Prunus cerasifera*	'Cherry plum'
Nectarine	*Prunus persica* var. *nucipersica*	Nuċiprisk
Nettleleaf goosefoot	*Chenopodium murale*	Għobbejra
Oat	*Avena sterilis*	Ħafur
Oleander	*Nerium oleander*	Oljandru
Olive	*Olea europaea*	Żebbuġ
Onion	*Allium cepa*	Basal
Orange	*Citrus sinensis*	Lariñġ
Parsley	*Petroselinum crispum*	Tursin
Parsnip	*Pastinaca sativa*	Fiġel
Passion fruit	*Passiflora edulis*	Frott tal-Passjoni
Pea	*Pisum sativum*	Piżelli
Peach	*Prunus persica*	Ħawħ
Pear	*Pyrus communis*	Lanġas
Pecan	*Carya illinoiensis*	Ġewż tal-Pekan
Pelargonium	*Pelargonium* sp.	Sardinell
Pepper	*Capsicum annuum*	Bżar
Perennial wall rocket	*Diplotaxis tenuifolia*	Ġarġir isfar
Petty spurge	*Euphorbia peplus*	Tengħud tal-ġonna
Plum	*Prunus domestica*	Pruna/Għajnbaqar
Pomegranate	*Punica granatum*	Rummien
Potato	*Solanum tuberosum*	Patata
Purslane	*Portulaca oleracea*	Burdlieqa
Roman nettle	*Urtica pilulifera*	Ħurrieqa taż-żibeġ
Rose	*Rosa* sp.	Warda
Runner bean	*Phaseolus vulgaris*	Fażola
Safflower	*Carthamus tinctorius*	Għosfor
Sarsaparilla	*Smilax aspera*	Salsa pajżana
Sea plantain	*Plantago maritima*	Biżbula
Shepherds' purse	Capsella bursa-pastoris	Ġarġir il-ġemel
Small burnet	*Sanguisorba minor* ssp. *muricata*	Tursin il-għal
Snapdragon	*Antirrhinum majus*	Papoċċi
Sow-thistle	*Sonchus oleraceus*	Tfief
Spanish sanfoin	*Hedisarum coronarium*	Silla
Spinach	*Spinacia oleracea*	Spinaċi
Spiny chicory	*Cichorium spinosum*	Qanfuda
Statice	*Limonium bonduelli*	Sempreviva

Statice	*Limonium sinuatum*	Sempreviva
Statice	*Limonium brassicifolium*	Sempreviva
Stock	*Matthiola incana*	Ġiżi
Stock	*Matthiola* sp.	Ġiżi
Strawberry	*Fragaria* x *ananassa*	Frawli
Strawberry clover	*Trifolium fragiferum*	Xnien
Strawberry tree	*Arbutus unedo*	Imbrjagla
Sunflower	*Helianthus annuus*	Fjura tax-xemx
Sunspurge	*Euphorbia helioscopia*	Tengħud tax-xemx
Sweetclover	*Melilotus indicus*	Trew
Tamarix	*Tamarix africana*	Bruka
Tomato	*Solanum lycopersicum*	Tadam
Traveller's joy	*Clematis cirrhosa*	Bajda/Kiesħa
False yellowhead	*Dittrichia viscosa*	Tulliera
Wall barley	*Hordeum murinum* spp. *leporinum*	Bunexxief
Wall pellitory	*Parietaria judaica*	Xeħt ir-rieħ
Washington fan palm	*Washingtonia robusta*	Palma
Watermelon	*Citrullus lanatus*	Dulliegħ
Wheat	*Triticum* sp.	Qamħ
White mulberry	*Morus alba*	Ċawsli
White poplar	*Populus alba*	Luq
White vetch	*Lathyrus ochrus*	Ġilbiena bajda
White wall rocket	*Diplotaxis erucoides*	Ġarġir abjad
Annual junegrass	*Rostraria cristata*	